The Journal of the American Medical Association

Published Under the Auspices of the Board of Trustees

VOL. 77, NO. 3 CHICAGO, ILLINOIS JULY 16, 1921

AUTOGENOUS BONE TRANSPLANTATION *

MELVIN S. HENDERSON, M.D.
ROCHESTER, MINN.

In my discussion I shall attempt to present briefly my experience in autogenous bone transplantations. I have carefully reviewed, with the assistance of Dr. Pio Blanco, the records in the Mayo Clinic of 413 patients on whom bone transplantation had been performed during the eight years between Jan. 1, 1913, and Jan. 1, 1921. It would be confusing and tiresome to discuss in statistics alone, so I trust you will pardon me if my deductions at times seem to be dogmatic. As nearly as possible I have based deductions on accurate clinical information, not trusting merely to clinical impressions. It is my hope that the conclusions and the deductions reached from this experience and study will be of interest and possibly of some value to you. There is no need to review the literature, for that has been done thoroughly by others. I feel, however, that I should express my appreciation of the impetus given this subject by Dr. F. H. Albee and by the late Dr. J. B. Murphy.

The study of autogenous bone transplantation is so interesting that it is difficult to adhere closely to the subject and not to follow out the many leads suggested by the investigation, but I shall try to keep to the main facts.

One hundred and sixty-six of the 413 patients were suffering from tuberculosis of the spine and were subjected to the operation, with various slight modifications, as originated and advocated by Albee. Of the remaining 247 patients, all but a few were operated on for ununited fractures.

SPINAL TRANSPLANTS

The definite end-results of spinal transplantation are not easily determined. Contrary to conditions in the fracture group, we are dealing with a condition which, though it may be the disabling factor, is practically always a secondary manifestation of a focus elsewhere. The operation and subsequent mechanical treatment are only a part of the procedure. Therefore, conclusions in such a group are more or less unreliable. It is not possible to see all the patients, one, two or more years after operation, and many times inferences must be drawn from correspondence.

The data I have to offer with regard to end-results are based on 132 patients who could be traced out of a total of 141 patients operated on more than eighteen months before. I have classified the disease as arrested or cured when the patients were free from pain and were able to resume their occupations, although not necessarily their original occupations. The postoperative complications of the entire group of 166 is available for study. There were only nine children in the series, since the operation is rarely advised for them.

Of the 132 patients concerning whom we were able to learn enough to warrant an opinion with regard to the end-results, there were sixty-six (50 per cent.) who may be considered cured, or with the disease arrested. Twenty-nine (21.99 per cent.) were improved, twenty-two (16.66 per cent.) were unimproved, and twelve (9.09 per cent.) died later. The exact cause of death in all instances could not be determined, but from correspondence with the patients' relatives and physicians, I should judge that the majority died of disseminated tuberculosis. Three (2.26 per cent.) died so soon after operation that their deaths must be regarded as postoperative mortalities, one dying of pulmonary embolism on the fourteenth day, and two of tuberculous meningitis in about the fourth week.

Only four (2.4 per cent.) of the 166 patients had postoperative infections, which is remarkable since all of the patients had had two incisions, one in the back and one in the leg. The legs were not infected, but in a few instances a hematoma developed which discharged bloody fluid and then healed. In at least two of the four patients who became infected, I believe that the cause was the breaking through into the wound of a tuberculous abscess. The graft was lost in two patients. In a few patients the devitalized skin over a prominent kyphos broke down; the exposure of the graft to the air caused a localized osteomyelitis. In two patients we later chiseled off the dead portion of the graft, which was followed by healing of the ulcer. This condition cannot rightfully be called an infection. In four patients who were not doing well, the roentgenograms disclosed the graft fractured over the kyphos, and in two we placed a graft on the opposite side of the spinous process. In a few cases we showed poor judgment in advising operation, failing to appreciate the poor condition of the patient. Generally speaking, draining sinuses no matter where they are situated, and pulmonary tuberculosis, unless quiescent, contraindicate surgery. A few of the grafts became loose and one end protruded against the skin because they were put in under tension. A bone graft should never be under tension. By taking the bone from the flat internal surface of the tibia, the graft can be sufficiently curved to fit almost any kyphos. I have found it advanta-

* Chairman's Address, read before the Section on Orthopedic Surgery at the Seventy-Second Annual Session of the American Medical Association, Boston, June, 1921.

geous to hold the transplant against the denuded spinous processes with beef-bone screws, using 6-32 machine size screws carefully placed at some distance from the kyphos, for a screw hole through the transplant at the apex of the kyphos might lead to fracture of the graft. This procedure is not always possible, particularly when the site of operation is in the upper dorsal region, the structure and slant of the spinous processes making it difficult to place the screws (Table 1).

The operation is in no sense of the word radical, and the patient cannot be offered the advantage of a removal of a portion of the tuberculous tissue and débris, as is offered in a resection of the knee. It would be an interesting contribution to our knowledge if two groups of patients of like age and under the same surgical control could be studied, one group being operated on, the other not operated on, and all the patients confined to bed for equal periods, with the same type of brace. I have not, however, made such a study and can merely state that my opinion concerning this group of patients who are subjected to bone transplantation for tuberculosis of the spine is that the results are more favorable than in those not operated on; that, owing to the uncertainty of the fate of the bone graft in children I seldom advise the operation for them, and finally, that, as the theory of the operation is logical and it gives better control of the average patient, I shall continue to advise the operation in adults.

TRANSPLANTS FOR DELAYED UNION, NONUNION, AND OTHER CONDITIONS

Two hundred and forty-seven patients were operated on for ununited fractures, bony defects, and so forth, and in all fairness, I may say that as a group they are difficult to treat successfully. One hundred and thirty-nine of the 247 had been operated on elsewhere, from one to six attempts having been made to induce union. Fifty-nine had been infected; many had great masses of scar tissue, and the skin was adherent to the bone so that a slough would have followed any interference. In some the mistake was made of operative interference too soon after the cessation of discharge and the infection was stirred up again.

TRANSPLANTS FOR UNUNITED FRACTURES OF THE LONG BONES

Patients with fracture of the tibia (102) formed the largest group. Fifty-five of these had been operated on before elsewhere. Two patients (1.9 per cent.) died from influenza. There were four (5.4 per cent.) infections in seventy-three clean cases, but the graft was not lost. There were nine (31 per cent.) infections in twenty-nine cases that were clean at the time of operation but had been infected previously. The bone graft was lost in four patients of this group. Seven patients were not traced. Thus, there are ninety-five patients on whom to base our statistics of the end-results.

TABLE 1.—SPINAL AUTOGENOUS BONE TRANSPLANTS

Patients operated on previous to Jan. 1, 1921	169
Patients operated on previous to Jan. 1, 1920	141
Patients operated on previous to Jan. 1, 1920, traced	122
Cured (or disease arrested)	60 (50.0 per cent.)
Improved	29 (21.9 per cent.)
Unimproved	22 (16.66 per cent.)
Operative deaths	3 (2.25 per cent.)
Later deaths	12 (9.09 per cent.)

One hundred and sixty-six patients each with two large incisions gave four (2.4 per cent.) infections. The graft was lost in two patients. Prominent kyphos may cause ulcer. Four patients fractured the graft and two were reoperated on. Occasional loosening of one end of the graft occurred, owing to tension. A curved graft and beef-bone screws should be used.

Fig. 1.—Massive autogenous graft applied to femur and held in place by six beef-bone screws. This graft gives abundant contact of endosteum to endosteum.

Eighty-five operations (89.4 per cent.) were successful; eight (8.8 per cent.) were failures. In order to secure the eighty-five cures, six patients were operated on twice; in other words, 101 operations were performed on the ninety-five patients.

In thirty-six patients, ten having been operated on elsewhere, bone transplantation was performed for ununited fractures of the femur. There was one operative death (2.07 per cent.). In thirty-four clean cases there were three (8.8 per cent.) infections; one graft was lost. Two cases, clean at the time of operation, but having been infected previously, suppurated and one graft was lost. Three patients were not traced; this leaves thirty-three patients on whom to base statistics of the end-results. Nineteen of these (57.5 per cent.) were cured, and thirteen (39.3 per cent.) were not cured. Three of the patients were operated on more than once, making thirty-six operations on the thirty-three patients, and, basing the statistics on the number of operations, 52.7 per cent. were cures. Twenty of the transplants were performed for old ununited fractures of the neck of the femur, with eleven successes and nine failures. Twelve were performed on the shaft, with eight successes and four failures.

Bone was transplanted to the radius in thirty-five patients, twenty-three having been operated on elsewhere; but as seven (20 per cent.) were not traced, we were able to ascertain the end-results in only twenty-eight patients; the statistics are compiled from these. Twenty-two (78.5 per cent.) of the operations were successful; six (21.5 per cent.) were failures. One patient was operated on by us twice. In twenty-eight clean cases, not infected previously, there were five (17.9 per cent) infections, and two grafts were lost. Three (42.8 per cent.) of the seven cases previously infected suppurated, but only one graft was lost.

The humerus was operated on in thirty-four patients, and all but one were traced. Twenty-six of these patients had been operated on elsewhere, some of them three and four times. Twenty-seven of the operations were performed in clean fields without infec-

tion previously, and four (14 per cent.) became infected, but only one bone graft was lost. Seven cases were clean at the time of operation but had been infected previously. Four (57 per cent.) became infected, and four bone grafts were lost. There were twenty-three (69.6 per cent.) successes, and ten (30.03 per cent.) failures. One patient was not traced. Six patients were operated on more than once, making thirty-nine operations on thirty-three patients, with twenty-three successes (56.4 per cent.).

Transplantations to the ulna were performed on eighteen patients. Seventeen of the cases were clean and had not been infected previously, but two (11.7 per cent.) became infected and in one the graft was lost. One infection developed in a patient who had been infected previously, but the graft was not lost. Two of the patients in this series were not traced, thus leaving sixteen for purposes of estimating end-results. Thirteen (81.2 per cent.) of the operations were successful; three (18.7 per cent.) were failures.

Autogenous grafts were used in nine patients who came to the clinic with nonunion following resection of the knee. Only six of these could be traced; all (100 per cent.) had union. One patient was infected and lost sight of. A bone graft was used in the patella in two instances; one patient could not be traced; the other obtained a good result. A graft was used in the nose once, and in the sacro-iliac joint once. Nine patients with ununited fractures of the jaw were operated on. All were traced; union resulted in seven (77.7 per cent.). One became infected but the wound healed later; one died of an intercurrent affection (Tables 2 and 3).

In the entire group of 247 patients with ununited fractures, 223 were traced. Basing end-results on these, it is found that 177 patients (79.3 per cent.) were successfully treated; forty-two (18.8 per cent.) were not cured. Eighteen of the patients were operated on twice, making 241 operations on 223 patients, with a resulting cure of 177 (73.4 per cent.). An attempt to study the failures by percentages is not enlightening, since the causes of failure are many and diversified. Infection is a prominent cause of failure, but does not necessarily mean failure. Faulty technic, poor coaptation of the fragments to each other and to the graft, poor external fixation, and lack of cooperation on the part of the patient may all tend to put undue stress on the graft and cause its fracture. In not a few instances when this has happened in my experience, union eventually occurred under proper fixation and control. Osteoporosis of the fragments is an unfavorable condition and should be overcome if possible. More and more I am advising patients with nonunion and osteoporosis to remove all casts or splints and use the part in order to get the bones in better condition to receive the transplant. It is almost a certainty that union will be obtained with the bone graft in a pseudarthrosis of many years' standing when the bone ends are of the eburnated type. This study, therefore, enables me to say that the most favorable bones to deal with in treating ununited fractures are the tibia, ulna, radius, humerus and femur, respectively. The percentage of infections in these cases, contrary to the infections in the spinal graft cases, is high, and this should be explained. In the 247 cases there were thirty-nine (15.7 per cent.) infections following our operation. It is only fair, however, to divide these cases into two groups: those in which there had been no infection previously and those in which there had been infection. In 201 cases, twenty (9.9 per cent.) clean cases, not infected previously but often having much scar tissue, were infected, whereas in the forty-six cases infected previously, nineteen (41.3 per cent.) were infected. This rate could be excused possibly in the cases infected previously, but cannot be so readily excused in the clean cases. There are certain extenuating circumstances. Most of the operations were difficult and prolonged, which means that tissues were handled, traumatized, exposed and often dried more than is proper. The technic is often somewhat difficult of application, particularly when previous operations have produced much scar tissue, and one of the fragments is short and near a joint. These are, I think, the main causes of the high percentage of infection, for the rate of suppuration in the easily conducted and short operations on the spine is quite low and will compare with any series of clean cases in the entire field of surgery. In the general surgical cases in the Mayo Clinic, Sistrunk has found that the average of infection in clean cases [1] is about 10 per cent. Our technic has not absolutely prevented the introduction of the gloved hand into the wound, but so far as was practical the actual handling of the tissues was done with instruments. I am quite sure that the percentage of infections in the same type of cases would be much higher if the autogenous bone graft were abandoned and beef bone or metal substituted. Metal is irritating to the tissues, and beef bone is not as readily tolerated

TABLE 2.—AUTOGENOUS BONE TRANSPLANTS FOR UNUNITED FRACTURES

	Traced	Operations	Success	Failure	Death
Tibia	95	101	85	8	2
Femur	33	36	19	13	1
Radius	28	...	22	6	..
Humerus	33	39	23	10	..
Ulna	16	...	13	3	..
Ununited knee	6	...	6	..	..
Jaw	9	...	7	1	1
Patella	1	...	1	..	..
Nose	1	...	1	..	..
Sacro-iliac	1	...	0	1	..
Total	223	...	177	42	4

There were 247 cases in all, but only 223 were traced, with 177 (79.3 per cent.) successes, and forty-two (18.8 per cent.) failures. There were four (1.7 per cent.) deaths, three due to influenza; one due to a cerebral embolus in a femur case. Tibia, 101 operations on ninety-five patients, giving 84.1 per cent. successes. Femur, thirty-six operations on thirty-three patients, 57.7 per cent. successes. Humerus, thirty-nine operations on thirty-three patients, 56.4 per cent. successes.

Fig. 2.—Intramedullary autogenous graft. No contact of endosteum to endosteum. In this situation the graft is a foreign body and will be absorbed.

1. These include all cases clean before operation and retroperitoneal cases not drained.

as an autogenous graft. Infection in not a few cases developed because of breaking down of the scar tissue in the deep structures, and occasionally because the skin sloughed. The possibility of a hematogenous infection should also be considered. The traumatizing of the tissues incident to the operation causes them to be devitalized and therefore susceptible to infection.

The manner in which the bone graft is used is also of prime importance. In our earlier work the intramedullary plug was used with indifferent success. The inlay graft is as nearly as is possible an anatomic approximation of tissues which appeals to one as being a surgically sound procedure. In a certain percentage of cases, however, in which the operation had been satisfactory in every respect and the postoperative fixation was as nearly perfect as possible, the graft broke, usually about the fifth to the eighth week. I think we are nearly all agreed that the bone transplant, at least in great part, is absorbed and replaced by new bone. During this period of absorption and replacement there is a period when the graft itself is weakened by the absorption, and the new bone deposited is too soft and fresh to be of any real support. At this time a slight stress will cause fracture of the graft. If the massive graft is used, the very size of the graft gives a margin of safety not given by either the intramedullary or the inlay graft. Also, the cancellous or endosteal tissue is the richest in osteoblasts. By denuding the fragments and exposing the layer of cancellous tissue, and applying the bone graft with its cancellous tissue to that of the fragments, large surfaces rich in osteoblasts are brought together. I believe that with the technic of firmly holding the transplant to the fragments with beef-bone screws, a large proportion of the transplant functions and lives without being absorbed and replaced by new bone.

I am certain that our results have been improved by using the massive graft and clamping it to the fragments by aid of beef-bone screws, and where there is sufficient muscle and soft tissue comfortably to cover it I shall continue to use it. The size of the massive graft in the tibia increases the tension on the skin, and may cause a necrosis of the skin and the death of the graft because of exposure. I prefer the inlay graft from the opposite leg if the bone is osteoporotic; if not, I use the sliding inlay reversible method.

TABLE 3.—AUTOGENOUS BONE TRANSPLANTS FOR UNUNITED FRACTURES

	Clean Cases	Infected Number	Infected Per Cent.	Previously Infected	Infected Number	Infected Per Cent.	Graft Lost
Tibia	72	4	5.6	29	9	31.0	4
Femur	34	3	8.8	2	2	100.0	2
Radius	28	5	17.8	7	3	42.8	3
Humerus	27	4	14.8	7	4	57.1	5
Ulna	17	2	11.7	1	1	100.0	1
Ununited knees	9	1	11.1	..	..	....	..
Jaw	9	1	11.1	..	..	....	..
Patella	2	..	....	..	..	....	..
Nose	1	..	....	..	..	....	..
Sacro-iliac	1	..	....	..	..	....	..
Total	201	20	9.9	46	19	41.3	15(6%)

There were thirty-nine (15.7 per cent.) infections in the entire 247 cases. In the 201 cases in which there had not been any previous infection there were twenty (9.9 per cent.) infections. In the forty-six cases in which there had been previous infection, there were nineteen (41.3 per cent.) infections.

Fig. 3.—Inlay autogenous graft applied to the tibia. Contact of endosteum to endosteum over a limited area. Two beef-bone screws are used to steady the graft.

SUMMARY

The cases studied comprised 413 patients subjected to the operation of transplantation of bone. One hundred and sixty-six of the patients were operated on according to the method of Albee for tuberculosis of the spine, and 247 were operated on for ununited fractures, bony defects, etc. One hundred and thirty-two patients with tuberculosis of the spine operated on more than eighteen months before have been definitely followed. Sixty-six (50 per cent.) may be regarded as cured or as having the disease arrested; twenty-nine (22 per cent.) were improved; twenty-two (16.66 per cent.) were unimproved; twelve (9 per cent.) died later, probably of disseminated tuberculosis; three (2.26 per cent.) died so soon after the operation that their deaths must be classed as operative mortalities. The operation is advised only in adults. Four (2.4 per cent.) developed infection in the wound in the spine; there were no infections in wounds of the leg. Two grafts were lost.

Two hundred and twenty-three of the 247 patients operated on for ununited fractures, etc., were traced. In 177 (79.3 per cent.) the operations were successful, and forty-two (18.8 per cent.) were failures. Four (1.7 per cent.) of the patients died. Two hundred and forty-one operations were necessary to obtain these successes; thus, the 73.4 per cent. successes are based on the number of operations rather than on the number of patients. In contrast to the spinal cases, which were better than the average in any group of clean cases, the percentage of infections ran high. Thirty-nine (15.7 per cent.) of the 247 patients developed infections. Two hundred and one had clean wounds. Many of them had been operated on before without suppuration, but often with considerable scarring; twenty (9.9 per cent.) of these became infected. Forty-six patients had been infected previously, although apparently the wounds were clean at the time of operation, and in nineteen (41.3 per cent.) suppuration followed surgical interference. These infections caused the loss of the graft in fifteen cases (6 per cent.), and in almost all a persistence of the nonunion. The technic used in the spinal transplants was used in the fracture transplants. In the first group the percentage of infections is considerably below and in the second, above normal. I believe, therefore, that the cause of the infections rests on the type of case rather than the technic. Possibly a two stage operation would lower the percentage of infections.

The percentage of successes in operations on the various long bones was: tibia, 89.4; ulna, 81.2; radius, 78.4; humerus, 69.6; femur, 57.5. The massive graft with beef-bone screws to hold it in place has given better results than either the intramedullary or the inlay graft.

DEFECTIVE DIET AS A CAUSE OF STERILITY

A STUDY BASED ON FEEDING EXPERIMENTS WITH RATS *

EDWARD REYNOLDS, M.D.
AND
DONALD MACOMBER, M.D.
BOSTON

The application of the term sterility to most, or all, infertile matings has led to much confusion of thought. In most of them, the failure of reproduction is, in fact, the result of decreased fertility rather than of actual sterility on the part of the two individuals concerned.

Actual sterility of individuals, of course, exists. There are cases dependent on anatomic malformations and other pathologic conditions in which the individual may be pronounced sterile even when mated with a fertile partner, until the local condition has been remedied; but these actual sterilities of anatomic or pathologic origin probably constitute but a small proportion of the infertile matings in either the human or other species.

TABLE 1.—COMPOSITION OF DEFICIENCY DIETS *

Diet Low in Fat Soluble Vitamin		Diet Low in Calcium	
Rolled oats	40.0	Whole wheat	67.5
Gelatin	10.0	Casein	15.0
Casein	5.0	Whole milk powder	10.0
Salt mixture (McCollum)	3.7	Sodium chlorid	1.0
Dextrin	40.3	Inert substance	1.5
Cod liver oil	1.0	Cod liver oil	5.0
Diet Low in Proteins		**Double Deficiency (War) Diet**	
Wheat	70.0	Wheat	60.0
Salt mixture (McCollum)	3.7	Sodium chlorid	1.0
Dextrine	21.3	Inert substance	1.5
Cod liver oil	5.0	Dextrine	32.5
		Cod liver oil	5.0

* It will be seen that each diet in this table contains an ample supply of all essential elements with the exception of the one for which it is designed to be deficient.

There are certainly a large number of infertile matings which are purely functional and due to physiologic alterations in general or local conditions. Such physiologic alterations moreover often coexist in the sterilities of pathologic origin and when unrecognized and consequently unremedied, undoubtedly explain a large proportion of the continued infertilities after operation.

EXPERIMENTAL WORK

Evidence to this effect which had accumulated in the course of our clinical work led us to plan, in 1919, an experimental study of this subject, and the production of infertility by partial dietary deprivation in essential substances proved to be the most practical method. This work is still in progress and is to be repeated with numbers large enough to be of final evidential value and fit for complete statistical treatment; but the results obtained from the smaller numbers seem now to warrant a provisional report.

As we have already described the experimental work in detail in a paper read before the American Gynecological Society last week, and as limitation of space prevented our taking up there the application of our conclusions to the treatment of human infertility, we wish in this article to give a summary of the experimental work, together with our conclusions, and then to proceed to their application to the human race, and to the corroborative evidence derived from our clinical experience. The article on the experimental work will be published in the *American Journal of Obstetrics and Gynecology*, and will supply the arguments in favor of our conclusions which limitation of space forbids our introducing here.

TABLE 2.—CHEMICAL ANALYSIS OF DIETS *

	Stock Diet	Low Fat Soluble Vitamin	Low Calcium	Low Protein	Double Deficiency or War Diet
Protein	18.0	19.6	22.4	6.4	7.1
Fat	10.1	3.8	6.7	6.5	6.3
Carbohydrate	55.3	62.1	53.0	69.5	72.3
Salts	4.7	4.5	2.6	5.0	2.1
Fiber	0.9	0.9	3.7	1.3	2.5
Moisture	11.0	8.1	11.0	9.3	9.6

* By comparing the various diets as to chemical constituents it will be noted that they are all adequate except for the designated deficiencies.

We used in this work a strain of albino rats which has been produced by Dr. Helen D. King[1] of the Wistar Institute. They had been inbred at the time we obtained them for thirty-four generations by brother and sister matings with selection for strength and health. Although well and strong they were of slightly diminished fertility as compared with Dr. Castle's heterogenetic strain, which was frequently used for rematings in testing individual fertilities. More than 90 per cent. of the matings of Dr. Castle's rats were fertile, while only 65 per cent. of matings from Dr. King's strain produced young when the rats were fed on the stock diet of Dr. Castle's laboratory. This figure of 65 per cent. is then the standard mating fertility for the check rats in our experiments which were on the stock diet of the laboratory.

We subjected rats of this strain to three deprivation diets, one of which was low in the fat soluble vitamin, one was low in calcium, and the third low in proteins. All these diets were given in unlimited quantity and were ample and similar in all other respects (Tables 1 and 2). These deficiencies were chosen as being

TABLE 3.—RESULTS OF MATINGS ON VARIOUS DIETS (KING × KING RATS) *

Diets	Number of Matings	Number of Positive Matings	Percentage of Mating Fertility	Percentage of Individual Fertility
Stock diet	23	15	0.65	0.51
Low fat soluble vitamin diet				
Proved	8	4	0.50	0.70
Unproved	13	4	0.31	0.55
Low calcium diet				
Proved	0	0		
Unproved	7	1	0.14	0.37
Low protein diet				
Proved	0	0		
Unproved	5	0		
Double deficiency diet (low in calcium and protein)				
Proved	3	0		
Unproved	5	0		

* This table shows the result of matings in which both partners were King rats and both were on the indicated diet.

those which are most often present in persons belonging to the well fed classes in the United States. To them we added a fourth diet which was deficient in both calcium and proteins. This diet gives an approximate representation of the most important deficiencies in the war and postwar diets from which portions of Europe have been, and still are, suffering, and is therefore of interest at the moment.

* This work was aided by a grant from the Elizabeth Thompson Science Fund.

* Read before the Section on Obstetrics, Gynecology and Abdominal Surgery at the Seventy-Second Annual Session of the American Medical Association, Boston, June, 1921.

1. King, Helen D.: J. Exper. Zool. 26: 335, 1918; 27: 1, 1919; 27: 29, 1919.

These diets reduced the mating fertilities of our rats from the normal 65 per cent. to 55, 31 and 14 per cent., respectively, in the several classes of deficiency diets as shown in the column headed Mating Fertilities in Table 3. It delayed the appearance of fertility in rats raised on these diets and lowered its degree as shown in the curves which are reproduced for each class in Figure 1. These results were produced, as is shown in Table 4, by a mere decrease in the percentage of the deficient element, not by its absence, and without any other change in the life conditions of the rats.

The production of so much infertility by so slight a change is surprising; but it is explained by the probability which our work already makes evident, that many sterile matings result from very slight decreases in the individual fertility of the two animals concerned, as is apparent by reference to the columns headed Average Individual Fertility in Tables 3 and 5.

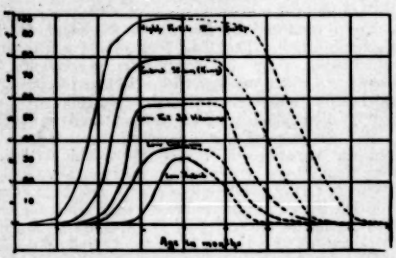

Fig. 1.—This chart combines percentage of fertility with the age at which reproduction first occurred for Castle rats, for King rats and for rats on the three single deficiency diets. The dotted half of each curve does not represent actual observations, but conforms roughly with the sexual life of these animals. The sharp rise corresponds to puberty and the sharp fall to the cessation of sexual activity. Note that the effect of deficient diet is to shorten and depress each curve as a whole.

The fertilities of individual rats were then obtained by repeated matings and by rematings with Castle rats of known fertility. When the indexes for all the matings were placed in a column in the order of their fertilities, it was found that reproduction did not occur when the calculated fertility of the matings was below 45 per cent.

TABLE 4.—VITAL ANALYSIS OF DIETS*

	Stock Diet (Ample in All Elements)	Low Fat Soluble Vitamin	Low Calcium	Low Protein	Double Deficiency (Low in Calc. and Protein)
Protein	18.0	19.6	23.4	8.4	7.1
Fat soluble vitamin	5.0†	1.0†	5.0†	5.0†	5.0†
Calcium	1.8	1.88	0.03	1.88	0.03

* The amount of the fat soluble vitamin cannot be determined by chemical analysis. The figures given represent the amount of the vitamin containing substance.
† Estimated.

This result[2] is given in Table 6, in which for simplicity only a small number of representative matings are introduced. In this method of estimation it was assumed that the fertility of a mating may be represented as the product of the individual fertilities of the two animals, as, for instance, $0.8 \times 0.8 = 0.64$, which is the mating fertility of the King rats on our stock diet, or $0.6 \times 0.6 = 0.36$ which would be negative mating. A mating fertility of 0.45 was found to be the "threshold for reproduction," below which young could not be expected and above which their arrival would be predicted.[3]

The threshold was not only approximately accurate when the rats used were of equally decreased fertility, but also held true when a rat of lowered fertility was mated to one of higher or full fertility (e. g., $1.0 \times 0.5 = 0.50$ = reproduction, $0.8 \times 0.4 = 0.32$ = a sterile mating, etc.).

TABLE 5.—RESULTS OF REMATINGS ON VARIOUS DIETS (KING × CASTLE RATS)*

Diets	Number of Matings	Number of Positive Matings	Percentage of Mating Fertility	Percentage of Individual Fertility
Stock diet	10	7	0.70	0.70
Low fat soluble vitamin diet				
Proved	0	0		
Unproved	20	9	0.45	0.45
Low calcium diet				
Proved	0	0		
Unproved	10	6	0.30	0.30
Low protein diet				
Proved	0	0		
Unproved	12	6	0.50	0.50
Double deficiency diet (low in calcium and protein)				
Proved	0	0		
Unproved	0	0	0	0

* This table gives the results of rematings rats from the negative matings of Table 3 with Castle rats of known fertility. Since such Castle rats are of practically 100 per cent. fertility the index of average individual fertility of their King rat partners is the same as the index of mating fertility. It will be seen that the individual fertilities of rats on the deficiency diets are so low as to have insured sterile matings with partners of the same grade (Table 6).

TABLE 6.—SCHEMATIC CHART OF FERTILITY*

Individual Fertility		Mating Fertility, per Cent.
1.0 × 1.0		1.00 or 100
0.9 × 0.9		0.81 or 81
0.8 × 0.8		0.64 or 64
0.7 × 0.7	Threshold for	0.49 or 49
		45
0.6 × 0.6	Reproduction	0.36 or 36
0.5 × 0.5		0.25 or 25
0.4 × 0.4		0.16 or 16
0.3 × 0.3		0.09 or 9
0.2 × 0.2		0.04 or 4
0.1 × 0.1		0.01 or 1

* The figures in this table vary from those actually obtained from the matings only in being restricted to even tenths for the sake of clearness. The establishment of 45 per cent. as the threshold for reproduction must, of course, be regarded merely as an approximation until larger numbers have been employed.

Repeated experiments showed moreover that if rats whose individual fertility had been decreased to, for instance, 0.6 were mated, their mating was sterile and remained sterile so long as these rats were kept together; but that if these rats with individual fertilities of 0.6 were each remated with highly fertile rats from Dr. Castle's strain the matings would both prove fertile.

These results frequently prove most illuminating when we come to compare them with problems which arise in the infertilities of the human race.

Another feature of the experimental work which is most interesting and important is the very slight change in the general condition of the rats which was produced by the single deficiency diets in spite of the great decreases in the fertility of their matings. This is shown in the illustrations of representative individuals from the several classes (Fig. 2 *A*, *B* and *C*) and by the individual weight curves shown in Figures 3 and 4. This also proves important when compared with clinical observations.

2. The result was obtained from rats on stock diet and will be retested with those on deficiency diets, though we have seen no reason to doubt its applicability.

3. In fact, study of all the matings made revealed that there were but two exceptions to this rule—in one case, young were produced in a mating with an index of 0.40, and in one mating with an index of 0.49, no young were produced, but these were the only exceptions out of thirty-three matings.

In Figure 2 *D*, a pair of rats which were brought to maturity on the double deficiency diet (the war diet) are shown. Their small size and poor condition is very evident when compared with the photographs of rats on the other diets. The individual weight curves are also evidence of this. This marked change of condition was attended by great loss of fertility, all their matings with each other proving sterile. We have obtained European statistics which show a corresponding decrease in human fertility in the countries of central Europe, notably in Austria, but lack of space forbids the reproduction of these statistics in this paper.

It seemed possible that the mechanism by which these infertilities were produced might be elucidated by study of the testicles and ovaries of the comparatively infertile rats, to which end we made serial sections of many of these organs. We intend to continue this study.

The work of Robinson[4] on prenatal death makes it probable that certain ova[5] contain within themselves conditions which make complete development impossible; but these conditions may, or may not, be morphologically visible.

Figures 5 and 6 are sections from the organs of rats on the single deficiency diets. We exhibit them with the statement that when compared with sections from normal animals (Figs. 7 and 8) they show no anatomic changes which have been demonstrated under the methods so far employed.

Figures 9 and 10 are sections of ovaries of rats on the double deficiency diet with their more extreme infertility. These ovaries do show several peculiar conditions which must be studied further, notably ova contained in unruptured graafian follicles which are composed of four cells. This section (Fig. 10) is to be compared with a normal ovum under high power (Fig. 11). These may be ova which have undergone premature segmentation; they may represent the development of four ova in a single follicle. We are uncertain what they represent and can at present make no statement about them except that they are plainly abnormal.

One further observation must be noted before we turn to the consideration of human infertility. We have been unable to find any mention of the birth of macerated fetuses in the literature, and Professor Castle has seen no such instance in the many years during which his laboratory has contained large numbers of rats on stock diet. But in matings on our single deficiency diets four such deliveries occurred and there were two more in eight deliveries in which young rats who had been reared on the war diet were subsequently placed on ample diet and bred to Dr. Castle's rats. This fact corresponds to a single but suggestive clinical observation which will herewith be reported.

HUMAN INFERTILITY

It is always unsafe to reason from one species to another, and the difficulties are increased when the organic constitution and life conditions of the one species are widely different from those of the other. Moreover the experimental methods which are easily utilized in rats and which give us their individual indexes cannot be applied to the infertilities of the human race; but if clinical observations are found to yield results comparable to those of the experimental work each supports and reinforces the other. The life conditions of the human race are much more complex than those of laboratory rats. Human diet is much more varied and many factors other than diet enter into the maintenance of a state of general good condition. In the well fed classes in this country the food placed upon the table is usually sufficient in all the essential elements, but peculiarities of taste or mistaken dietary theories not infrequently lead to the choice of a diet which is insufficient in one or the other of the vital elements.

The history of a couple who were referred to us in 1919 offers a parallel to the miscarriages observed in our rats on deficiency diets.

The husband was normal in every way and thoroughly fertile. The wife was a large, well nourished woman in ordinarily good health, but reported herself as lacking in energy and

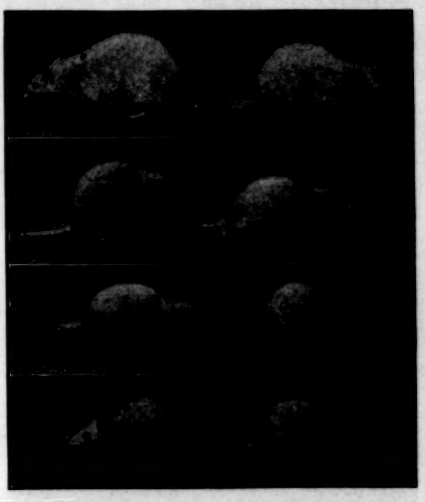

Fig. 2.—*A*, rats fed on stock diet; *B*, rats fed on low fat soluble vitamin diet; *C*, rats fed on low calcium diet, and *D*, rats fed on double deficiency or war diet.

constantly tired, perhaps in a condition quite comparable to that of the single deficiency rats. They had been married seven years. Ten months after marriage, she was delivered of a full term child which was alive at the beginning of labor, but died during an operative extraction. During the succeeding six years she had five pregnancies which resulted in five early miscarriages. These people were in the habit of maintaining a very ample table, and a deficiency in diet seemed absurd; but since an exhaustive examination failed to reveal any other cause for the habit of abortion, an inquiry was instituted.

It was found that during her first pregnancy (which went to term) she had eaten everything, but that finding herself growing stout soon after the birth of the child she had then begun to restrict her diet. On analysis it proved that she had been living for the six years during which she had miscarried repeatedly, on a diet which was very deficient in calcium. She was at once put on large doses of calcium, her diet was rearranged to include foods rich in calcium and after a reasonable interval the medicinal calcium was discontinued.

4. Robinson, Arthur: Edinburgh M. J. **20**: 137 (March) 1921.
5. Probably also certain spermatozoa.

She went into her seventh pregnancy shortly afterward and without any other treatment was delivered at term of a healthy child.

No single case proves anything, but when this is considered in connection with the experimental work in rats and with similar results obtained by Steenbock[6] in swine and cattle it suggests the question whether

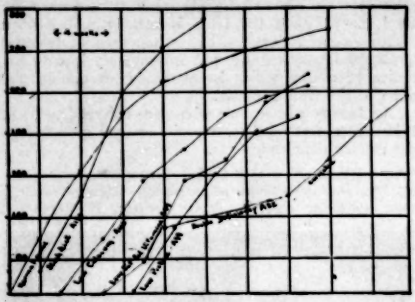

Fig. 3.—Weight curves for male rats.

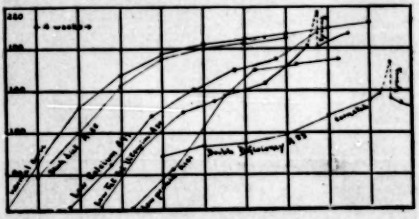

Fig. 4.—Weight curves for female rats

dietary deficiencies may not be worthy of consideration in other cases of habitual abortion in the human race.

In laboratory animals the importance of individual peculiarities has been but little, if at all, investigated. In human beings individuality is a very important factor. We have seen a number of cases of infertility in young athletes who have abandoned training and gone into sedentary business life. It seems probable that such men acquire or possess a necessity for the ingestion of a large amount of proteins and the exercise which is necessary to carry them off, and that with a change in habit they fail in fertility.

In March, 1920, a young couple were referred to us from New York for analysis of their case. They had been married four years, and pregnancy had occurred shortly after marriage but had terminated in a miscarriage at three months. There had been no further pregnancies. The wife appeared to us to be probably fertile, the husband's semen had been examined several times by a well trained physician and considered normal because the field always contained spermatozoa in active motion. On more careful examination we found that their numbers were far below the normal, the percentage of motility was small and the character of motility was poor. The heads of most of them contained an abnormally small amount of chromatin. From our experience with similar cases we believed him to be decidedly infertile. He had been a well known college oarsman, and had rowed for five years, eating during a large portion of each year the enormous supply of proteins of a training table. He had then entered a professional school, had changed suddenly to a sedentary life and to very hard mental work. He had married in the first year of this regimen, and though he had promptly impregnated his wife, the pregnancy was unsuccessful (remember the miscarriages in the rats) and no further inpregnation occurred. It proved on inquiry that he was at the time of his visit thinking of devoting the next six months to a graduate course which would mean easy work with ample time for exercise. He was also at the time under pressure to join a crew which was then training for a race a few months later. On our recommendation he decided to adopt this plan of three months' training with only moderate intellectual work and to return at the end of the three months for reexamination of his semen. The case fails in completeness from the fact that the second visit proved unnecessary as the wife found herself pregnant at the end of two months and a half. We have recently heard that she was successfully delivered at term.

In the human race nervous overstrain plays an important part in loss of good condition. This appears to be equally true in both sexes, but can be more accurately observed in the male by examination of the semen.

In December last, we were consulted by a couple who had been married five years without a pregnancy. The wife had been operated upon for local abnormalities but without result, and their physician was confident that the persistent infertility was due to defective fertility on the husband's side. He was leading a sedentary life with very heavy business responsibilities. He was about 18 pounds under the preferable weight of the insurance tables and had a low diastolic blood pressure. He was pale and decidedly nervous in manner and appearance. His testicles were very soft and decidedly small, a fact which we have noted repeatedly in cases of lowered fertility both in the human race and in the rats. Secretion obtained by massage of the vesicles and prostate was extremely watery.

Fig. 5.—Section of testis from rat made sterile by low fat soluble vitamin diet; × 500.

It contained a few leukocytes and not even a normal amount of prostatic salts. Examination of his semen revealed almost no spermatozoa, and those mostly still. He looked well except for his evident nervousness. He was advised to absent himself from business, to live in the open air, to go into light training under the advice of a professional trainer and to play golf and tennis in increasing amount as his condition improved. This advice was strictly carried out under extremely favorable circumstances. Four months later his

6. Hart, E. B., and Steenbock, H.: J. Biol. Chem. 39: 209 (Sept.) 1919. Steenbock and Humphrey: Research Bull. 49, Wisconsin Experiment Station.

semen was reexamined by his physician and the report sent us showed that numerically there were from 75 to 100 spermatozoa in a high power field—a very fair number. We should judge from the report that their motility was good, and no abnormality was detected. No pregnancy has as yet occurred, but so great an improvement in a short time is fair testimony that his previous seminal condition was purely functional and the result of an overstrained nervous condition.

Fig. 6.—Section of ovary from rat made sterile by low calcium diet; × 300.

In human beings normal assimilation of the food ingested seems to be as important as the mere choice of food eaten, constipation is always important, and we have seen three cases in which deterioration of general health from intestinal retention was apparently the sole cause of infertility.

March 6, 1919, we were consulted by a young couple who were becoming worried because they had been married for ten months without pregnancy. The husband was in excellent health, the wife considered herself well but admitted that she was "run down." Her complexion was pale and pasty looking, she had been for some months troubled with persistent acne, she complained of backache and a sensation of weight in the pelvis.

On the table a satisfactory examination was prevented by the fact that an enormously overloaded sigmoid occupied almost the entire pelvis. Under liquid petrolatum, forced catharsis and increased ingestion of water the bowels were gradually emptied and at the end of a month were moving regularly under mild catharsis. The vagina and cervix had been considerably congested, evidently from obstructed pelvic circulation, and she had for some weeks been instructed to use vaginal suppositories of boroglycerin at night. At the end of eight weeks she was in greatly improved general health and they were to report after her impending period for a complete sterility examination. This period failed to appear, she proved to be pregnant and was delivered of a living child at term.

A decision that a given infertility is dependent on anatomic cause and demands operation should not lead to neglect of accessory constitutional conditions.

In September, 1913, we examined a husband and wife who had been married three and one-half years without a pregnancy. Examination revealed that the husband was thoroughly fertile, but the wife had an anteflexion of a much underdeveloped cervix. The cervical mucus was retained, inspissated and sticky. All the spermatozoa found in the cervix were entangled and unable to progress. The uterus was in right lateral version and there was a cystic right ovary. She was suffering from severe dysmenorrhea and sense of pelvic weight. Operation was recommended, and both a plastic and an abdominal operation were performed. Good results were obtained with an excellent convalescence. The dysmenorrhea and bearing down sensation were relieved and general health improved, but no pregnancy resulted. Two years later reexamination showed that the cervix was patulous, the secretions normal and that the spermatozoa penetrated well, abundant numbers being found even at the fundus in postcoital examination. Everything local looked normal but pregnancy had not occurred. The patient, though improved in general health, was nearly 20 pounds under the insurance weight, tired easily and was still pale and nervous. She was in health, but in poor condition. She was put on a regulated diet designed to increase weight, in combination with regulated exercise. Under this regimen she gained 10 pounds in two months, and went away to continue the treatment. A year later she reported that she was six months' pregnant and she was subsequently delivered at term.

This patient was treated before our attention was called to the specific effects of diet, but is selected in illustration of our belief that many of our failures in past years were due to neglect of constitutional ill health in cases in which local abnormalities of etiologic importance had been relieved by minor or operative treatment.

COMMENT

The necessity for brevity forbids the report of further cases, but these have been selected as typical instances.

That many individual infertilities are functional rather than due to anatomic or pathologic causes; that very moderate decrease of fertility in both individuals may produce a completely infertile mating; and that, as was fully proved in our breeding experiments, two rats that are infertile to each other may both be fertile

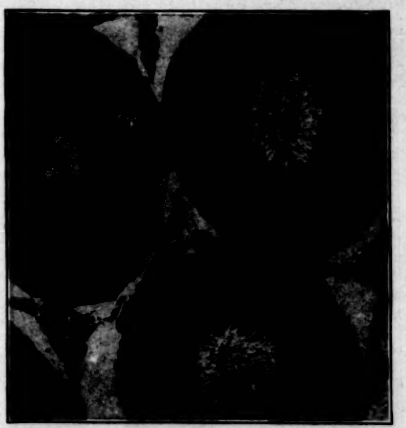

Fig. 7.—Section of normal testis; × 500.

to other individuals, not because of obscure incompatibilities, but merely because of a decreased percentage of fertility in each, are points worthy of much consideration.[7]

321 Dartmouth Street.

7. For the effect of diet on reproduction on which this paper was based see McCollum, E. V.: The Newer Knowledge of Nutrition, New York, the Macmillan Company, 1918. Osborne and Mendel: J. Biol. Chem. **35**, 1918; **41**, 1920; Science **45**: 294, 1917; J. Biol. Chem. **23**: 439, 1915; **30**: 351, 1915.

ABSTRACT OF DISCUSSION

Dr. Edward Reynolds, Boston: This experimental work grew out of our clinical experience, and its results have thrown much light on subsequent clinical experience. The most interesting point seems to be the probability that merely decreased fertility on each side of a union may result in a permanently sterile mating, although each partner would be fertile to a new partner of high fertility. That deficient diet produces sterility does not rest on our experiments, but has been shown especially by many investigators for many species of animals. That decreased diet in degree insufficient to produce any noticeable ill health will produce a decreased fertility of individuals in a degree to make them infertile to each other, we think we have established. Turning to the human side, it is impossible in the more complicated human life to obtain the same accurate view, but as one's experience grows large, as cases accumulate, the weight of cumulative evidence grows strong. As time goes on we feel more and more convinced of the importance of the functional element in sterility, more especially when it is coincident with the anatomic or pathologic cause. And just as slight decrease in fertility from moderate deficiencies in the vital elements of diet produces infertile unions, so we are convinced that local alterations in the organs, insufficient to produce conspicuous ill health, do produce decreased fertility which results in a sterile union. Our present view of sterility in the human race is that each case demands extended and accurate analysis of each partner, general and local, and it should be conducted not on the principle of determining causes of ill health, but it should be a search for the lesser causes which decrease fertility to the point of producing sterile unions.

Dr. W. Blair Bell, Liverpool, England: Fifteen years ago I called attention to the importance of the calcium metabolism in the reproductive function. I conducted a series of experiments on hens. I was able to tell when these hens laid eggs, when they did not lay them at all, and when they were going to lay them, simply by an examination of the calcium in the blood. I then pursued this question in regard to women. I showed that by an examination of the systemic blood one could exactly prognosticate their condition and ability in regard to menstruation. I have pursued these studies clinically ever since. I have for many years treated

Fig. 8.—Section of normal ovary; × 300.

these cases of habitual abortion and some cases of sterility with calcium, with very good effects, on the whole. A woman must have a very active calcium supply in order to part with 800 gm. to her fetus in nine months. In some cases she draws on her teeth and bones to supply the deficiency of the blood. After the child is born, she requires a very high calcium content of the blood to carry on the function of lactation. This important matter must be worked out farther if we are to prognosticate what leads to the deficiency. We are now in possession of methods whereby we can watch this calcium content very closely.

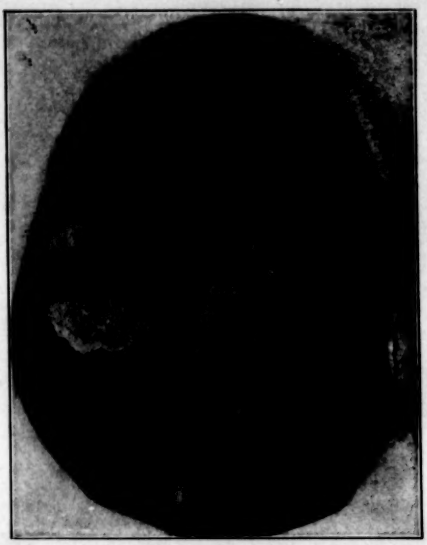

Fig. 9.—Section of ovary from rat made sterile by war diet; × 300.

Dr. Albert J. Ochsner, Chicago: Those of us who are experienced practical farmers will be able to recall many instances in the breeding of domestic animals to which all of these principles that have been brought out by this excellent paper will apply. Every one of these principles has its definite application in our everyday work in breeding farm animals. Unfortunately, those facts that the practical farmer knows and uses in his work are not always applied scientifically to the human being, and are not proved as they are in this case. Some years ago when the breeding of pure cattle became an important part of the progressive farmer's business in this country, it was found that a large proportion of the highest type of cows were sterile; and it was found that a farmer owning a large herd of these animals virtually had to choose between destroying these animals as beef cattle, receiving for them almost nothing, or go out of the breeding business. So the veterinarians conducting the experimental stations made a careful study and found that the sterility in these animals depended to a large extent on the fact that the graafian follicles in the ovary had remained unruptured; that is, they remained stationary. Whenever these graafian follicles were ruptured, almost immediately the cow became fertile. Some years ago my brother, who is also a practical farmer like myself, applied this method of treatment to the human being, and since that time we have applied it in a large number of cases of sterility which were not due to the other ordinary and most common causes, and we have found that it is quite as effective in the human being as it is in animals. Under general or spinal anesthesia two fingers are placed in the rectum, and with these the ovary is pressed against the hand on the abdomen with sufficient force to rupture the follicle.

Dr. Emil Novak, Baltimore: The influence of diet on the function of reproduction was evidenced, on a huge scale, in

the wave of amenorrhea (Kriegsamenorrhöe) which swept over the continental countries, especially Germany and Austria, during the recent war. This effect on menstruation was produced by a combination of the dietetic privations and the psychic factors associated with war conditions. As for the general subject of sterility, I have been impressed by the frequency with which the cause is to be sought in tubal obstruction. I have repeatedly encountered cases in which such measures as cervical dilatation or the use of cervical pessaries have been carried out, and in which the real cause of the sterility proved to be a chronic inflammatory tubal disease. These cases are sometimes difficult of diagnosis, as the tubes may show little or no enlargement on bimanual examination. On the other hand, there is a very clearly defined group of cases in which sterility is the result of developmental defects of the uterus. These instances of genital hypoplasia are often observed in women who otherwise are perfectly healthy and well developed. The cause of such uterine hypoplasia is undoubtedly to be sought in the endocrine system, although the exact nature of the disturbance cannot be stated. Dr. Bell has done much work along the lines of calcium metabolism as related to the physiology of the female reproductive organs. My own feeling has been that such calcium fluctuations are merely a manifestation of a more deeply underlying endocrine change. Dr. Ochsner's reference to the production of sterility in cattle by corpus luteum cysts is interesting, and is, of course, known to all farmers and veterinarians. I do not believe that the same phenomenon takes place very frequently in human beings, although corpus luteum cysts are relatively common. They not infrequently cause amenorrhea, though usually of short duration. The question is sometimes asked as to why, if the corpus luteum causes menstruation, the persistent corpus luteum, in the form of a corpus luteum cyst, should inhibit menstruation. There is nothing paradoxical in this fact, if we remember that the corpus luteum, while it is essential to menstruation, does not actually cause

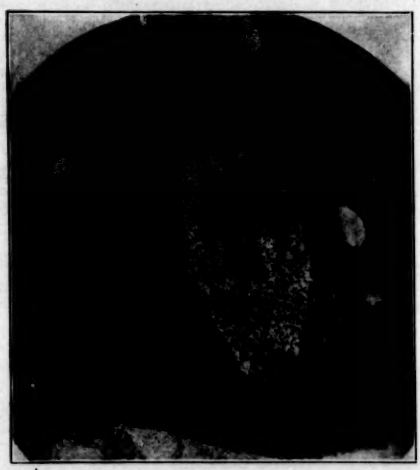

Fig. 10.—Section of ovary from rat made sterile by war diet; × 500. Four cells in the follicle may be noted.

the hemorrhage. It merely causes the preparatory or premenstrual hypertrophy in the endometrium. The actual menstrual hemorrhage is a catabolic or destructive process occurring in the endometrium when pregnancy does not supervene, its immediate cause probably being the death of the ovum thrown off at the preceding ovulation.

DR. DONALD MACOMBER, Boston: A possible explanation of the high occurrence of sterility in pure bred animals, as mentioned by Dr. Ochsner, is probably the fact that they are largely inbred. The strain which we used in our experiments

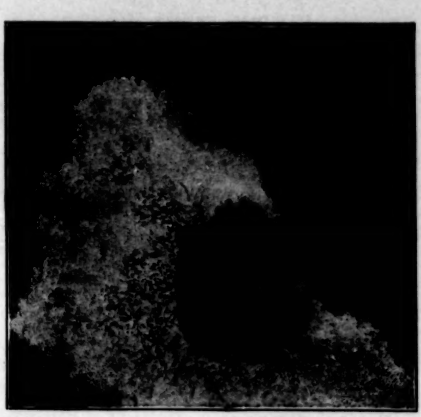

Fig. 11.—Section of normal ovary; × 500.

had been inbred brother and sister matings for thirty-four generations. It showed a percentage of fertility of sixty-five as compared with ninety-six, which was the percentage of Dr. Castle's heterogenic stock. Dr. Ochsner and Dr. Novak spoke of the procedure common with veterinaries of rupturing cysts in the ovary. Dr. Reynolds has long practiced it in human beings. One must differentiate between retained graafian follicles which have undergone a certain degeneration and corpora lutea which instead of being absorbed persist and occasionally become cystic. The sterility of cattle, which is relieved by rupturing cysts in the ovary, is usually due to the presence of these cystic corpora lutea. In human beings it is not unusual to find them associated with underdeveloped anteflexed uteri. These patients are almost all of the slender, underdeveloped type, and often complain of dysmenorrhea. Removal of the corpora lutea often results in a return of ovarian function with relief of sterility. When the ovaries contain many small retained follicles, the interference with normal function is largely due to the increased tension. Puncturing these cysts by the mere mechanical relief of pressure often causes such ovaries to function normally. Dr. Novak spoke of the effect of the war diet in Europe. We have certain statistics for Austria which show that the birth rate has fallen more than 50 per cent. since before the war in spite of a slight increase in the marriage rate. Dr. Taylor of Pennsylvania reported that the diet of a large part of the population of Austria at present is one which is largely deficient in milk, butter and eggs. These foods carry most of the calcium of the food and are at the same time the chief sources for the fat soluble vitamin. Our experience has shown us that when two deficiencies are combined, the effect is much greater than when only a single deficiency is involved.

Dyspepsia Cures.—Harm occurs in all the dyspepsia cures. The relief that seems so magical could in most cases be gained without the "-ure cures," from a few swallows of milk, toast or cracker, but even then the thorough examination is essential to real success, and putting this off on account of simulated relief may make all the difference between real recovery and a painful and fatal illness.—G. Dock, *J. Missouri M. A.* **18**:84, 1921.

A NEW METHOD OF TREATING RECENT FRACTURE OF THE OS CALCIS

DAVID C. STRAUS, M.D.
CHICAGO

Fracture of the os calcis is a rather common type, comprising approximately 2 per cent. of all fractures. In the great majority of cases it is due to a fall from a height, the patient landing on his feet, on some hard substance, such as the ground. When the foot strikes the ground, the os calcis is suddenly held rigid while the weight of the body is transmitted to the astragalus, which acts as a wedge. The tuberosity of the os calcis is forced upward by the impact. As a result, the line of fracture usually extends downward from the concave articular facet beneath the wedge-shaped articular surface of the astragalus. Not only

Fig. 1.—Most common type of fracture of os calcis: flattening of longitudinal arch of foot and typical upward displacement of tuberosity of os calcis.

is the posterior fragment of the os calcis driven upward by the impact at the time of fracture, but it is held in this position by the constant tone of the Achilles tendon. The latter presents the chief obstacle to reduction. The longitudinal arch of the foot gives way at the time of fracture, with a resulting traumatic flat-foot (Fig. 1). Any logical form of treatment must be directed to overcome these two deformities.[1]

I have recently evolved the following method:

The patient is placed on a Hawley table so that traction can be made with the patient held stationary. A general ether anesthesia is employed. Subcutaneous tenotomy of the Achilles tendon is performed. A long Steinmann pin of the latest model, which screws together at its center, is used. This is sterilized with the two halves unscrewed. Before the two halves are screwed together, the threaded ends are dipped in sterile oil. After the pin has been screwed together, one of the sharp ends is held by placing it in the metal handle used to introduce the pin. After the upper surface of the body of the os calcis immediately in front of the Achilles tendon on the medial side of the foot has been palpated, the Steinmann pin is pushed through the skin, from the medial to the lateral surface of the heel, so as to avoid striking the posterior tibial vessels, and so as to lie immediately above the body of the os calcis and immediately anterior to the Achilles tendon. The pin extends an equal distance beyond each side of the foot (Fig. 2).

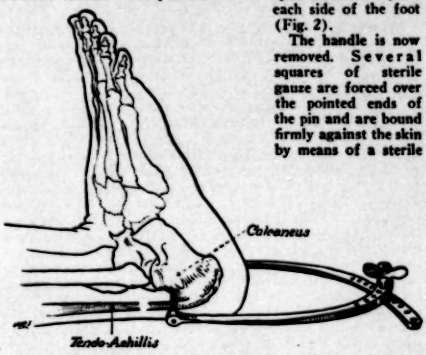

Fig. 2.—Diagram to show point of insertion of Steinmann pin and method of application of calipers. The Achilles tendon is divided before the Steinmann pin is inserted.

The handle is now removed. Several squares of sterile gauze are forced over the pointed ends of the pin and are bound firmly against the skin by means of a sterile gauze bandage, to guard against the possibility of infection when the plaster cast is applied.

The Steinmann caliper is now applied to the pin, and downward traction is effected by an assistant who stands beyond the end of the table (Fig. 3). The reduction is then made in the usual manner. Any impaction present is broken up. The posterior fragment is drawn strongly downward, while the anterior portion of the foot is forced downward and

Fig. 3.—Manner of maintaining downward traction of posterior fragment while the cast is being applied. Ordinarily the operator has two assistants, one of whom maintains the downward traction on the posterior fragment, as shown, while the second supports the leg, the operator applying the plaster bandage. After the plaster bandage has been applied, the operator uses the orthopedic block to maintain upward pressure under the instep and make any necessary correction in the position of the foot.

1. A brief summary of and reference to the more important recent articles on the subject may be found in the chapter on fractures in Keen's Surgery 7:441, 1921, contributed by Dr. Eisendrath and the author.

strongly inverted, while counterpressure upward is made against the anterior fragment of the os calcis and the arch of the foot, by means of an orthopedic block. The block also aids in correcting the median displacement of the astragalus. The foot is held in the corrected position, and sheet wadding is applied from the knee to the toes. A plaster-of-Paris cast is applied, reaching from the tuberosity of the tibia to the heads of the metatarsal bones (Fig. 3). While waiting for the cast to set, continuous traction downward is

Fig. 4.—Same case as shown in Figure 1 after reduction, with cast applied and set, and pin removed.

maintained. This constitutes the great advantage of this method. While this downward traction is being maintained, upward pressure on the anterior fragment and the instep is maintained by use of the orthopedic block, care being taken to hold the astragalus in its proper position. This position is maintained until the plaster has set. The Steinmann pin is now unscrewed and each half is removed. Since the two portions of the pin are removed from within outward, there is no danger of infection. This is further guarded against by injecting, with a medicine dropper, a few drops of tincture of iodin through the holes in the plaster cast left by the removal of the pin.

The cast is left on for four weeks. It is then removed and passive motion is begun, together with massage and hot foot-baths, daily. The patient is not allowed to bear any weight on the foot till the end of ten weeks. He is then fitted with an arch support, and begins to walk with the aid of crutches.

The chief advantage of this method is that it permits continuous downward traction of the posterior fragment and upward pressure of the arch, with the foot held in the proper position, during the entire time necessary for the plaster cast to be applied and to set.

30 North Michigan Avenue.

Radium in Cancer.—The report of Dr. Harvey R. Gaylord, director of the Gratwick Cancer Laboratory in Buffalo, to the state legislature shows encouraging results from the state's purchase of $250,000 worth of radium. Of 537 cases treated, many apparently hopeless, 358 showed marked improvement. The effectiveness of the remedy, according to Dr. Gaylord, is due to a sufficient quantity of radium for a given purpose and improved technic in its application. The laboratory will soon install a roentgen-ray apparatus with higher penetrative power than used heretofore.

CARCINOMA DEVELOPING ON GASTRIC ULCER *

CHARLES H. MAYO, M.D.
ROCHESTER, MINN.

Cancer continues to take its deadly toll from human life. In this country more than 80,000 die yearly from the disease; nearly a million lives have been thus sacrificed in the last decade. Cancer is the dread disease of middle life and of old age, made so by the prolonged suffering which accompanies it. The dread is far worse than the brief period of fear in times of pestilence, or of fear of sudden death from cardiac disease. Whether the increase in the disease is real from some defect in advancing civilization, or whether it is more apparent because of increased knowledge from closer observation, and more accurate statistical reports is a question. The work of the Committee on Cancer Research of the American Medical Association and various commissions composed of interested investigators has done much to educate the public concerning the condition, its treatment, and especially its prevention. Members of the medical profession are paying greater attention to the relief of recurring chronic local inflammation and to the removal of sources of local irritation, believed to be concerned in the development of cancer. Through these influences, a greater number of patients appear for operation earlier, at a time when the disease is curable. Cancers, from the standpoint of heredity, while they are interesting in lower life, are fewer than the general law of averages in man.

HISTORICAL

A review of the literature concerning cancer is exceedingly interesting from a historical standpoint and calls to mind that old saying, "There is nothing new under the sun." The earliest records concerned only the treatment of the disease. In Egypt, India and Persia the condition was recognized 1500 B. C., when

Fig. 1.—Carcinoma, 3 mm. in diameter, on the border of a gastric ulcer, 2.5 cm. by 2 cm. by 0.5 cm. in diameter.

the Egyptians applied arsenic paste in its treatment, a remedy used internally many centuries later. Hippocrates excised cancer with the cautery more than four hundred years B. C., a method still in use as a general destroyer of carcinomatous tissues. Celsus at

* Read before the Section on Surgery, General and Abdominal, at the Seventy-Second Annual Session of the American Medical Association, Boston, June, 1921.

the time of the birth of Christ employed the knife for the clean dissection of cancer, and vessels were ligated to check the growth of inoperable tumors, a method revived a few years ago by the late Dr. Dawburn of New York. In the second century, Leonides used the knife and cautery in clean dissections. From that time little was added to the treatment of cancer until the recent development of serum therapy, endocrine therapy, roentgen-treatment and radium emanations. From what has been accomplished in the brief period of their use, especially by radium, I predict the possibility of surgery becoming an adjunct to these methods instead of the major method of treatment.

ETIOLOGY

From the point of view of etiology, Galen, in the second century, considered that the body consisted of solids and four fluids, blood, mucus, yellow bile, and black bile. He believed that the concentration of the latter was the cause of cancer, a theory which held sway for many centuries, when it was refuted by Paracelsus who substituted that of a local concentration of mineral salts as an exciting cause of the disease. If we substitute cholesterol for mineral salts we have a modern point of view for special stimulus of cell growth. The seventeenth century witnessed the development of the lymph theory of cancer, in which the lymph node involvement was given some prominence. The acid theory, namely, acid as a stimulus to cell growth, which is under discussion at the present time, was advanced in Germany at an early period by Helmont and by Ettmuller.

In a consideration of this theory, it should be appreciated that in the normal acid areas of the body occur the greatest number of cancers; thus, in the organ of highest acidity, the stomach, are probably one third of the cancers of men, and more than one fifth of the cancers of women. In the large bowel are many cancers as compared with the few in the alkaline small bowel. In the urinary bladder, tumors are common, as they are in the uterine cervix, which is bathed by fluids of increased acidity during the ten years preceding and following the climacteric. Within the tissues subject to normal degeneration, such as the uterus and the mammary gland, the acids formed by lipoid degeneration, a well known chemical process, may be a possible local factor to stimulate cell growth. In this connection the work of Loeb in pathogenesis is of interest. He immersed the unfertilized eggs of sea urchins in sea water acidulated to 1 per cent. with various acids, of which butyric acid was the most active, and then returned the eggs to sea water for development, and a goodly percentage of the eggs became fertilized and hatched.

The general use of the microscope, from its development in 1592, made possible a minute study of the disease, and education advanced rapidly as the printing press recorded hypotheses and facts. The influence of coal smoke impregnated with sulphur has been extensively investigated in several districts of England and also in our own country as a possible external factor increasing the development of cancer. In 1775 Pott described the first occupational cause of cancer, the work of the chimney sweep. Several instances of such development have been noted since then. The influence of fluids bathing cells in cancer environment was recorded by Maunvir in 1820; he asserted that the cells arise from morbid fluids which bathe them. While this is now refuted for cancer, it is believed by some, including myself, that a change, not necessarily morbid, in the fluid bathing the embryo, is a possible cause of congenital or embryologic malformation. Malformations of the nervous system in fresh water frogs were studied by Loeb by developing their fertilized eggs in 0.6 and 0.7 per cent. solutions of salt water.

Fig. 2.—Low power photomicrograph of (a) carcinoma on the border of the ulcer, associated with (b) marked lymphocytic infiltration and fibrosis.

PROGRESS IN INVESTIGATION

The importance of recurring local inflammation as a field for cancer development was appreciated by Broussais. Recamier investigated infiltration, and used the word metastasis in describing growths arising from parent tumors. Virchow developed an accepted foundation for the study of cancers and other tumors. He stated, in 1860, that all cells come from preceding cells, but he made the mistake of believing that connective tissue changes into epithelium, a theory which was opposed by Ramek. The cell changes from the normal through stages of involution with impairment of nutrition and loss of functional capacity, as seen in cancer, were described by Thiersch. Waldeyer advocated the theory of connective tissue isolation of a few epithelial cells, either internal or external, as the origin of cancer, which harmonizes with Thiersch's theory of nutritional changes, and was also strongly supported by Ribbert, and showed that it harmonizes with the origin of cancer of the stomach in isolated cells separated in the snare of connective tissue in a chronically inflamed field. He also demonstrated the foundation of secondary tumors as a continuous growth through blood and lymph vessels as well as transmission by cell emboli.

Clinical observations concerning such distribution of cancer of the stomach show that approximately 20 per cent., or more, of such cancers are confined to the stomach until the death of the patient from obstruction, perforation and peritonitis. In these cases there is no clinical evidence of metastasis in the lymph glands, liver, and distant or adjacent viscera. They compose a group favorable for operation with increased prospect of permanence of cure, except as the operation is modified by the extent of the involvement or the high location of the disease.

Ewing in his excellent work on malignant disease, in discussing glandular involvement in gastric cancer, quotes Verse as finding accidentally, at necropsy, twelve cases of early cancer of the stomach without glandular involvement, and Cuneo as finding lymphatic invasion at necropsy in eight cases of gastric cancer, but in thirteen gastrectomies only two. The theory of tumor development from misplaced embryonal cells, known as Cohnheim's theory, became obsolete following Waldeyer's work, although the statement of Durante,

made in 1874, that all tumors arise from embryonic cells or immature cells and that tumor cells have some relation to sex cells is generally acceptable. In plant life nothing more is required to stimulate local areas into normal tissue growth than extensive cell destruction; the injury or loss of epithelium itself is apparently one of the greatest stimulations to activity of reproduction of marginal cells, for example, callus development and normal repair of injury. The theories of bacterial and parasitic causes of cancer development as originally advocated have not been proved. I believe that the chemical action of bacteria and not their mere presence should be considered as an irritative agent of connective tissue formation and a possible source of chemical stimulation, such as toxin or other product of their activity. The specific bacterial agent of several diseases has been discovered within but a few years after many years of search.

Clinical observations show that the previously traumatized epithelial areas are much more susceptible than normal epithelial areas to the development of cancer: for example, cancer of the uterine cervix, following laceration; cancer of the lip in areas of chronic irritation from a fissure or herpes; cancer of the tongue or cheek from a broken tooth as an irritant; the degeneration of scar tissue; cancer of the gallbladder, which is associated with gallstones in more than 85 per cent. of cases; and ulcer of the stomach, in the larger number of which with a diameter of 2 cm. or more, according to MacCarty and Broders, the margins are involved by cancer. W. J. Mayo, in 1915, called attention to the hot foods and drinks taken as civilization developed, a change from the food intake of primitive people, the degree of heat often being greater than epithelium can stand. He explains the fact that fewer women have gastric cancers, since in serving the members of their household their food becomes cooled before it is taken. There is but little difference of opinion with regard to external cancer of the breast or lip. The clinician, the surgeon, and the pathologist see them in approximately the same stages, and they see 63 per cent. of cancers of the lip developing on areas of previously repeated or chronic inflammations without comment.

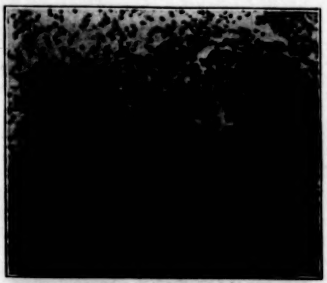

Fig. 3.—Low power photomicrograph of an area of (a) carcinoma lying near a lymph follicle, in border of ulcer.

In discussing cancer of the stomach originating on ulcer, it is probably best to drop the percentage basis, since pathologists obtain material for examination at necropsy, of late gross lesions from which the patient died, or of material removed surgically, and are dependent largely on the point of view of the local clinicians and surgeons with regard to the excision of the ulcer or its destruction, regardless of whether a gastro-enterostomy, or a pyloric operation is performed. The removal of ulcers by cautery (Balfour) has largely replaced excision, hence it is more difficult for pathologists to secure early specimens for examination, and instead of discussing the real problem of a possible source of cancer of the stomach, time is wasted on the discussion of the percentage of cancers of the stomach that might develop in this manner, often with their judgment based on seeing the conditions in the late stages. The modern cytobiologist has wonderfully advanced the use of the microscope in the study of the single cell, and thus with extensive experience, is often able to diagnose cancer on the evidence of a single cell or a few cells, this, however, by immediate examination of frozen fresh tissue.

In the period of evolutionary life, when two or more types of cells became grouped to develop multicellular life and live a community existence, was the control over the cell a community control or an individual cell control? If it were a community control, then Cohnheim's theory of misplaced embryonal cells as a cause of the origin of cancer would be worthy of serious consideration. If it is possible that the cell is controlled by some granule within the cell, it might be exhausted or fail to appear in both parts of a cell division when exhausted by a chronic stimulus to division. I believe a biologic cause of cancer is exhausted epithelial areas induced by age, chronic traumatism, or irritation; an activating agent would be the environment, such as acid, especially butyric, one of the combined acids of the stomach and a product of lipoid changes.

THE DEVELOPMENT OF CANCER

MacCarty says:

Insofar as cancer (a migratory hyperplasia) is concerned, my observations have revealed a biologic reaction which is malignant only insofar as it destroys the communistic organization of cells.

The three fundamental biologic reactions to destruction (hypertrophy, hyperplasia, migration) have been found to occur not only in relation to the specific tissue of the breast, but also in relation to the specific tissues of the prostatic gland, skin, hair follicles, stomach, lymphatic glands, blood, bone, cartilage, and connective tissue. In all these chronic destruction (the biological etiological factor in cancer) of the specific tissues, calls forth hypertrophy, hyperplasia, and sometimes migration of the reserve cells.

Although these reactions may seem new in reference to human pathology, they are well known to biologists who have made a study of reaction to destruction. In fact, many biologists are of the opinion that exposure of living matter to destructive factors has led to adaptive potentialities that are the factors of safety in the structure and functions of all forms of life; nature has been just as efficient in her defensive preparation in the construction of the human body.

It may be stated as a biologic law that hypertrophy, hyperplasia, and migration are stimulated primarily by destruction. These phenomena are the effects of which destruction is the cause.

In nature the specific agent of destruction is rarely if ever anticipated. In the mammary gland and stomach destruction is the main factor, as it is with the other tissues which have been studied.

The reactionary cells of the three conditions described are apparently normal cells which answer the structural description of normal cells as found any place in nature. Their relation to the communistic organization of cells is their principal abnormal or pathologic characteristic.

It has been observed that nature provides for the regeneration of human tissues in two ways, which might be called direct and indirect, the former consisting of division of specific tissue cells, and the latter of the division of reserve cells which are set aside for the purpose of regeneration of specific

tissues by the process of multiplication, specialization and differentiation. Direct regeneration of tissue represents the most primitive form of reproduction and doubtless occurs in the reproduction of endothelial tissues and perhaps some others, the reserve cells of which have not been seen. Indirect regeneration is seen in such specific tissues as those represented by squamous cells of the skin, secretory cells of the sebaceous, sweat and mammary glands, fibrous connective tissues, lymphocytes, erythrocytes, osteocytes, chondrocytes and glandular cells of the prostate, all of which specific tissues possess reserve cells which have been seen. During chronic destruction of these tissues the reserve cells react in a definite manner with a certain sequence characteristic of the behavior of living cells throughout nature. They become hypertrophic, hyperplastic, and migratory. In the light of biology these may be interpreted as hyperactivity against antagonistic things or forces; increase of mass action against such antagonists, and attempt at change of environment, all of which are defensive reactions and constitute the essential means of self-preservation.

The exact starting point of cancer of the stomach is, and probably will remain, unknown; but the early cancers which have been observed in this organ have been seen in the mucosa in the borders of chronic ulcers (Fig. 1).

One finds simple chronic gastric ulcers in which there are no signs of cancer; one also finds similar ulcers in which the normal columnar cells of the gastric tubules are partially or completely replaced by spheroidal or ovoidal undifferentiated cells, the cells being intratubular. One also sees similar ulcers in which the ovoidal or spheroidal cells are also extratubular and hence in the stroma (Figs. 2, 3 and 4).

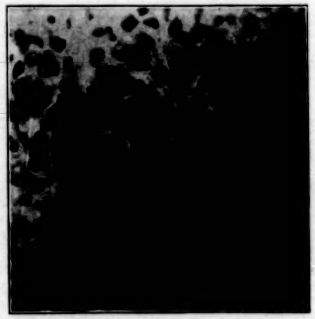

Fig. 4.—High power photomicrograph of the carcinomatous area shown in Figure 3.

Williams states that 60 per cent. of cancers of the stomach occur at the pylorus, where only 12 per cent. of ulcers occur. Welch reports 36.5 per cent. of ulcers just above the pylorus, where 12 per cent. of cancers occur. This shows the greater influence of trauma on fewer ulcers in the more active areas of the stomach. In considering the influence of environment, practically five ulcers occur in the acid-reducing first portion of the duodenum to one in the stomach. At the Mayo Clinic during the years 1919 and 1920, 3,463 duodenal and gastric ulcers were diagnosed. Of these 1,673 were operated on. Fifty-eight patients had both gastric and duodenal ulcers, 1,352 had duodenal ulcer alone, and 263 had gastric ulcer alone. The percentage of mistakes in diagnosis, as shown by operation, is exceedingly small. The duodenum is resistant to cancer. The few cancers in this region occur as a rule in adenomas, or in a duct entrance, rarely in ulcer. The influence of the duodenal secretion which passes into the stomach through the gastro-enterostomy opening to some extent lowers the acid and changes the environment by overcoming retention. This possibly has some effect in checking the effects of irritation of ulcer or even the activity of cancer. Bamberger's statement, that of 1,025 patients who had gastro-enterostomies and who were observed for some time, only twenty-two developed cancer, should apply only to gastric ulcer. If more than eight hundred duodenal ulcers are withdrawn from this number, the twenty-two patients will be equivalent to approximately one in six.

In order to emphasize the greater danger from gastric than from duodenal ulcer the data from Hunter's report are summarized.

OPERATIVE RESULTS

In Hunter's investigation in behalf of the New York Life Insurance Company to determine a basis for insurance following operation for gastro-enterostomy for ulcer, the results of 2,431 consecutive gastro-enterostomies performed during several years at our clinic were studied. All but 108 patients were traced, twenty-two of whom had had ulcers of the stomach. Five hundred and twenty-one patients with ulcer of the stomach were under observation for an average of three and six-tenths years. The mortality was 17 per cent; the first year it was four and one-third times the death rate in a like group in the general population; the rate diminished during the remainder of the period. One thousand, six hundred and fifty-one patients with duodenal ulcer were under observation for an average of three and four-tenths years; the mortality was 5 per cent., which is approximately that of the normal death rate of an equal number of persons in the general population of the same average age. Ninety-one persons with gastric and duodenal ulcers were under observation for an average period of three and eight-tenths years; the mortality was 15 per cent. It is impossible to state the exact cause of death in this group of cases as the patients die at their homes and definite reports are rarely obtained.

There is a tendency to belittle the dangers of ulcer of the stomach. The condition occurs less frequently than duodenal ulcer, but is more serious. As a rule, ulcers of the stomach or the duodenum are not operated on early, but only after a complaint of some years' duration. A wide variation in the sensitiveness of the abdomen exists in various persons; some with little trouble complain bitterly. Often patients appear for a general examination because of loss of appetite, loss of weight and strength with increase in pallor and are found to have extensive cancer of the stomach without distress or appreciable bleeding. In 1919 and 1920, at the Mayo Clinic a diagnosis of cancer of the stomach was made in 1,529 cases. In approximately 54 per cent., the condition was considered inoperable because of the extent of the disease, metastasis, complications, and so forth. In 162 an exploratory operation only was performed. In seventy-four gastro-enterostomy was performed for the relief of obstruction as a palliative operation. Two hundred and twenty-three patients were subjected to the radical operation of resection of the stomach. More could have been done for many of the patients had the condition been recognized earlier.

It will take years of observation to estimate fairly accurately the percentage of cancers which have occurred on ulcer, even if from one in twelve to one in six are thus developed. I believe the percentage is higher. Concering cancer in general, it seems

probable that we have sufficient data to show that several causes contribute to its development, and that irritation, partial destruction, and environment play the most important parts. In this type of cancer some degree of protection can be given to the individual if the disease is recognized early and is relieved.

The exact starting point of cancer of the stomach is unknown and probably will remain unknown, but the early cancers in this organ have been seen in the mucosa in the borders of chronic ulcers.

Simple chronic gastric ulcers in which there are no signs of cancer are found. Similar ulcers in which the normal columnar cells of the gastric tubules are partially or completely replaced by spheroidal or ovoidal undifferentiated cells, the cells being intratubular, are also found, as are ulcers in which the ovoidal or spheroidal cells are also extratubular and hence in the stroma.

PROPHYLAXIS AND SERUM THERAPY OF YELLOW FEVER *

HIDEYO NOGUCHI, M.D.
NEW YORK

Experimental transmission of yellow fever to animals and the isolation of *Leptospira icteroides* was accomplished in Guayaquil in 1918,[1] and repeated confirmations have since been made. During December, 1919, and January, 1920, Noguchi and Kligler, working in Merida, Yucatan, succeeded in transmitting yellow fever to guinea-pigs and isolating *Leptospira icteroides*,[2] and again in northern Peru later in 1920.[3] In the summer of the same year, in Vera Cruz, Perez-Grovas [4] and his co-workers were able to produce experimental yellow fever and obtain cultures of *Leptospira icteroides*.

The latest confirmation (January, 1921) comes from Le Blanc of the Rockefeller Institute, who has also successfully transmitted the disease from a patient in Vera Cruz to guinea-pigs and has obtained a culture of *Leptospira icteroides*. The cultures obtained by Perez-Grovas and by Le Blanc have been sent to me, and I have found them to be identical with other strains of *Leptospira icteroides*. Gastiaburu,[5] of the Instituto de Higiene of Lima, transmitted yellow fever to guinea-pigs from cases occurring during an epidemic in Piura, Peru, in 1919. Stimson,[6] of the U. S. Public Health Service, had demonstrated in 1907 the presence of a spiral organism, now identified as *Leptospira icteroides*, in a preparation, stained by the Levaditi method, of the kidney from a yellow fever patient dying during the epidemic in New Orleans in 1905.

The symptoms and lesions produced in animals by the inoculation of *Leptospira icteroides* [7] closely parallel those of human yellow fever, and comprise mainly jaundice, hemorrhages and intense acute nephritis. In the guinea-pig the degree of hemorrhage is very marked in the lungs and on the serous surfaces of the stomach and intestines, while minute hemorrhages of various dimensions occur almost constantly from the mucosa into the gastric cavity or intestinal canal. In young dogs the hemorrhages of the lungs are generally slight, but the hemorrhages from the mucosa of the gastro-intestinal tract, producing so called "black vomit" and melena, make the picture almost identical with that of yellow fever in human beings. The lesions produced in the marmoset, the only species of monkey which has so far been found to be susceptible to experimental infection with *Leptospira icteroides*, are intermediary between those of the guinea-pig and those of the dog. While the distribution and degree of hemorrhage in the different species of animals varies, the more or less pronounced fatty degeneration of the parenchymatous cells of liver and kidney is always present.

The specific immunity reaction for *Leptospira icteroides* demonstrated with the serums of yellow fever convalescents in Guayaquil,[8] Merida,[3] and Peru [5] constitutes further proof of the etiologic relation of this organism to yellow fever. The existence of this property in convalescent serum led to a study of the possibility of preparing a specific immune serum for the treatment of yellow fever and to a consideration of the effect of the inoculation of killed cultures of *Leptospira icteroides* as a means of protection against the disease.

SERUM TREATMENT OF YELLOW FEVER

The Serum Treatment of Animals Experimentally Infected.—Preliminary therapeutic experiments with an immune serum,[9] prepared in the horse, in experimental yellow fever in guinea-pigs showed that the serum had definite value in checking the progress of the infection and that it was capable, when administered during the period of incubation, of completely preventing the development of the disease. Moreover, when used in the early stages of infection it modified the course of the disease and prevented a fatal outcome. At a later stage, however, when jaundice and nephritis had been present from two to three days and the animal was near collapse, the serum had no perceptible beneficial effect.

The strength of the serum was such that, when injected simultaneously in a quantity as small as 0.001 c.c., it had the power to neutralize 5,000 minimum lethal doses of *Leptospira icteroides*, that is, 1 c.c. of the serum was capable of neutralizing 5,000,000 minimum lethal doses. It was found that infection could be prevented when 0.1 c.c. of the serum was injected at any time during the period of incubation (i. e., within seventy-two hours after inoculation). After onset of fever, that is, ninety-six hours after inoculation, the same amount of serum either arrested the progress of the infection or modified its course to that of a nonfatal infection. On the other hand, as much as 1 or 2 c.c. of the serum failed to prevent fatal termination of the disease when administered after the animals had reached the stage of intense jaundice, descending tem-

* From the Laboratories of the Rockefeller Institute for Medical Research.

1. Noguchi, Hideyo: Etiology of Yellow Fever, Papers I-XII, J. Exper. Med. **29**: 547-596 (June) 1919; **30**: 1-29 (July) 1919; **30**: 87-93 (Aug.) 1919; **30**: 401-410 (Oct.) 1919; **31**: 135-168 (Feb.) 1910; **29**: 381-400 (Oct.) 1920.

2. Noguchi, Hideyo, and Kligler, I. J.: Experimental Studies on Yellow Fever Occurring in Merida, Yucatan, J. Exper. Med. **32**: 601 (Nov.) 1920; Immunological Studies with a Strain of Leptospira Isolated from a case of Yellow Fever in Merida, Yucatan, ibid. **33**: 627 (Nov.) 1920.

3. Noguchi, Hideyo, and Kligler, I. J.: Experimental Studies on Yellow Fever in Northern Peru, J. Exper. Med. **33**: 239 (Feb.) 1921; Immunology of the Peruvian Strains of *Leptospira icteroides*, ibid. **33**: 253 (Feb.) 1921.

4. Perez-Grovas, P.: Experimental Transmission of Yellow Fever, J. A. M. A. **76**: 362 (Feb. 5) 1921.

5. Gastiaburu: Personal communication to the author.

6. Stimson, A. M.: Note on an Organism Found in Yellow Fever Tissue, Reports U. S. P. H. S. **22**, Part 1, 541, 1907.

7. Noguchi, Hideyo: Symptomatology and Pathological Findings in Animals Experimentally Infected, J. Exper. Med. **29**: 547 (June) 1919.

8. Noguchi, Hideyo: Properties of Blood Serum of Yellow Fever Patients in Relation to Leptospira Icteroides, J. Exper. Med. **30**: 9 (July) 1919.

9. Noguchi, Hideyo: Serum Treatment of Animals Infected with Leptospira Icteroides, J. Exper. Med. **31**: 159 (Feb.) 1920.

perature, hemorrhages and nephritis, and were nearing collapse.

Serum Treatment of Yellow Fever in Man.—The serum was first tried in the treatment of human yellow fever in September, 1919, when an American marine on the U. S. S. *Chicago*, off Honduras, was treated by Dr. W. Lyster and Gen. T. C. Pareja. The next patient treated was the Mexican minister to Nicaragua, also by Drs. Lyster and Pareja. The results in these two cases were regarded by Lyster and Pareja, as well as by General Gorgas, who was also present, as definitely indicative of the value of the serum, and led to the treatment of other cases. The total number of treated cases up to Dec. 31, 1920, is 170 (Table 1).

During a small epidemic occurring near Los Amates, Guatemala, in July, 1920, the serum was employed by Dr. Vaughn in four cases, in three of them on or before the third day of illness, in the other later. The three patients treated early all recovered, the other died. In Salvador, forty-two patients were treated with serum by Dr. Bailey, fourteen on or before the third day of illness. Three of the fourteen, however, received a quantity of serum which, Dr. Bailey states, was "too small to have any material effect" (20 c.c. in the course of the third and fourth days). These three patients died; the other eleven all recovered.[10] Twenty-eight patients were treated later than the fourth day of illness, and in these cases the usual high mortality rate of yellow fever (46 per cent. in this instance) was apparently unaffected by the use of the serum. In Mérida, eight cases have been treated by Drs. Hernandez, Lara and Villamil, who report four recoveries among four cases treated with serum before the third day and four deaths among those treated later. In Vera Cruz, in 1920, sixteen cases were treated with serum on or before the third day without any mortality, while three patients treated after the third day all died.

TABLE 1.—ANALYSIS OF ONE HUNDRED AND SEVENTY CASES OF YELLOW FEVER TREATED WITH ANTI-ICTEROIDES SERUM

	Treated on or Before 3d Day			Treated After 4th Day		
Group 1:	Total	Recovered	Died	Total	Recovered	Died
Salvador, 1920	14	11	3*	28	15	13
Guatemala, 1920	3	3	0	1	0	1
Honduras, 1919	1	1	0	..	..	..
Mexico, 1920						
Mérida	4	4	0	4	0	4
Vera Cruz	16	16	0	3	0	3
Gutierrez Zamora	17	17	0	1	0	1
Peru, 1920	4	3	1†	..	..	..
Total, Group 1	59	55	4 (6.7%)	37	15	22 (59%)
Group 2:						
Tuxpan, Mexico, 1920	36	27	9 (25%)	38	21	17 (45%)
Total, both groups	95	82	13 (13.6%)	75	36	39 (38%)

* Total of 20 c.c. in two days, begun on the third day, undoubtedly too small to have any material effect (Dr. Bailey).
† Patient subjected to forced journey during first two days of illness; disease extremely severe; patient exhausted, with severe nephritis, when admitted to the hospital.

In Gutierrez Zamora, Mexico, eighteen patients were treated with the serum. All recovered except one patient who did not receive serum until the end of the fourth day of illness. In the same town there were three cases seen before the third day of illness but not treated with serum; these three patients died. In Peru, four cases were treated early in the disease, with one death. This last case was exceptional, however, in that the boy had been brought through a tropical desert after onset (a journey of thirty-six hours) and had severe nephritis when admitted to the hospital. In Tuxpan, Mexico (Table 1, Group 2) seventy-four cases were treated with serum, thirty-six on or before the third day. The results reported from Tuxpan are the least favorable of all those reported—nine deaths and twenty-seven recoveries (25 per cent. mortality). The remaining thirty-eight cases were treated later than the third day, with twenty-one recoveries and seventeen deaths (45 per cent. mortality).

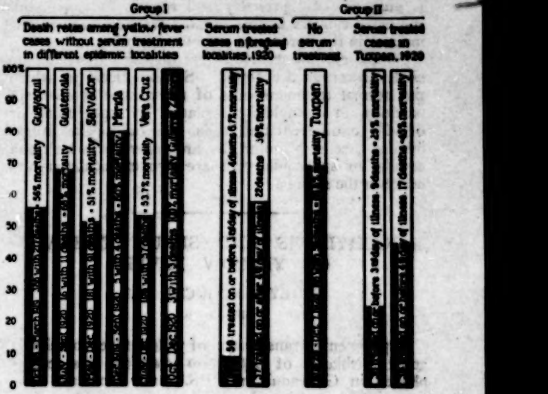

Chart 1.—Death rates among yellow fever patients with and without serum treatment.

An examination of the results of serum treatment in various localities shows a general agreement among them: the earlier serum is given, the lower the mortality. Exclusive of the Tuxpan series, fifty-nine patients were treated on or before the third day; of these, fifty-five recovered and four died. It has already been explained that in three of the four cases in which death occurred, the total amount of serum administered during a period of two days was 20 c.c.; the fourth case is that of the Peruvian boy who was subjected to a long journey after the onset of fever. The total mortality in this series was, therefore, 6.7 per cent. In Tuxpan the mortality among cases treated early was 25 per cent. (seventeen were treated on the third day alone, with 19 per cent. mortality), while the death rate of later treated cases was 45 per cent. The reduction in mortality among cases treated on or before the third day is undeniable. On the other hand, the serum does not seem to exhibit any beneficial effect on the course of the disease when given after the fourth day of illness.

For comparison there are given in Table 2 the death rates of cases not treated with serum during the various epidemics. They vary according to the number of cases included in the statistics—the fewer the cases, the less reliable the percentages. The lowest rate was in Salvador (51 per cent.), the highest in Merida (80 per cent.) and Gutierrez Zamora (100 per cent). Comparison of the mortality rates among these untreated cases with those of cases treated with serum on or before the third day brings out a great difference in favor of the treated cases which is difficult to explain on the ground of acci-

10. It has been recommended that when there is no danger of anaphylaxis, 60 c.c. of serum be given intravenously at the earliest opportunity.

dental coincidence. Apparently the serum actually helped to cut the infection short before it had caused irreparable injury to the organs, particularly the kidneys. Once such injuries have been done, however, as is usually the case in severe yellow fever by the fourth day of illness, an antimicrobial serum cannot be expected to effect any restoration. In certain of these

TABLE 2.—DEATH RATES IN VARIOUS LOCALITIES AMONG YELLOW FEVER CASES NOT TREATED WITH SERUM

	Cases	Deaths	Mortality Percentage
Guayaquil, Oct., 1918-Mar., 1919	396	217	55.0
Guatemala, July-Sept., 1920	16	11	68.8
Salvador, May-Dec., 1920	181	91	51.0
Mérida, Dec., 1919-Sept., 1920	5	4	80.0
Vera Cruz, July-Dec., 1920	109	57	53.7
Gutierres Zamora, 1920	3	3	100.0
Tuxpan, Aug. 29-Oct. 7, 1920	73	59	80.8
Total	783	442	56.4

cases, however, a marked improvement has been reported to have occurred after the administration of serum, owing probably to the fact that parenchymatous disorganization was proceeding slowly.

VACCINATION AGAINST YELLOW FEVER

Vaccination of Experimentally Infected Animals.—Early experiments showed that the injection of killed cultures of *Leptospira icteroides* into susceptible animals conferred on them a state of immunity which rendered them resistant to subsequent inoculation with virulent cultures.[11] The duration of this immunity has been found to be at least five to six months; the maximum duration is yet to be determined.

Vaccination of Human Beings.—The absence of any ill effects following the injection of killed cultures into animals led to the application of a similar procedure to human beings. The results of the early experiments in Guayaquil have already been reported.[11] The potency of the vaccine available at that time was rather low

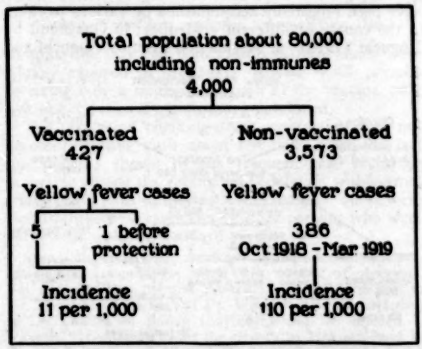

Chart 2.—Yellow fever vaccination, Guayaquil, Ecuador, 1918, 1919.

(2,000,000 leptospiras per cubic centimeter, as compared with 2,000,000,000, which represents the concentration of the preparation now used), yet its protective effect was undeniable. No cases of yellow fever developed among those persons who received 2 c.c. of vaccine. The number of nonimmunes in Guayaquil was not definitely known, but a liberal estimate would place it at about 4,000. Of these, 427 were vaccinated, of whom five later contracted yellow fever—a morbidity rate of 11 per thousand. During the same period (October, 1918, to March, 1919) there were 386 cases of yellow fever among the unvaccinated, a rate of incidence of 110 per thousand (386:3,577) (Chart 2).

The strength of the vaccine, as already noted, has since been greatly increased, and preparations of many times the concentration of that used in Guayaquil have been employed by Lyster, Bailey and Vaughn in Guatemala and Salvador, Vasconcelos, Casasús, Lynn and others, in Mexico, and by the department of health of Peru. The additional number of persons vaccinated is about 7,500. The vaccine has been given in two subcutaneous injections of 2 c.c. each, when possible, although, as the table shows, circumstances often prevented the administration of the second injection. The results of all vaccinations to Dec. 31, 1920, are summarized in Table 3.

TABLE 3.—VACCINATION AGAINST YELLOW FEVER IN MAN

	Number Vaccinated	Number Receiving Two Injections
Guayaquil, 1918-1919	427	.....
U. S. S. Chicago, 1919	75	75
Marines and others, 1919	250	250
Amapala, 1919	175	175
Salvador, 1920	3,607	138
Guatemala, 1920	1,383	582
Tuxpan, Mexico, 1920	1,000	2,000
Tambogrande, Peru, 1920	67	.....
Total	7,984	3,220

The incidence of yellow fever among the vaccinated may be considered in two groups: (*a*) those in whom the disease developed within a comparatively short time—from one to ten days after the time of the last inoculation, and (*b*) those in whom infection took place one month or longer after vaccination. Since the longest incubation period in yellow fever in man, as experimentally determined by the French Yellow Fever Commission in Brazil, is twelve days, and the average from three to six days, the group of vaccinated individuals under Group *a*, that is, those who contracted yellow fever within from one to ten days after vaccination, must be excluded from a consideration of the protective effect of the vaccination. On the other hand, the occurrence of yellow fever among vaccinated persons after the lapse of one month or longer would indicate inefficacy of vaccination as a prophylactic measure. As the statistics given in Table 3 show, 4,230 persons received two inoculations of the vaccine; among these all the cases which occurred fall in the *a* group. There were eighteen such cases, all of which showed the symptoms of yellow fever within from one to ten days after the last inoculation. The remaining 3,734 persons received only one injection of vaccine; among the number, five typical cases of yellow fever (Guayaquil, 1918-1919 [11]) and five in which the symptoms were suspicious (Dr. Bailey's report from Salvador, 1920) arose in from one to three months. It has already been noted that the vaccine employed in Guayaquil was several hundredfold less strong than that used later in Central America and Mexico. In addition to these ten cases there were also, in the single vaccination group, eight persons in whom yellow fever developed within from two to ten days after vaccination (one in Guayaquil, five in Salvador, one in Guatemala, and one in Tambogrande, Peru).

The epidemic of yellow fever in Salvador broke out in May, 1920. Vaccination was begun in August, and

11. Noguchi, Hideyo, and Pareja, Wenceslao: Prophylactic Inoculation Against Yellow Fever, J. A. M. A. 76:96 (Jan. 8) 1921.

up to Dec. 31, 1920, 3,607 persons in the infected areas had been vaccinated, 138 of whom had received two injections of vaccine. The total number of non-immunes in the ten infected districts was, according to Dr. Bailey's estimate, 113,000. Among those who received two injections of the vaccine, no case of yellow fever occurred. In the group receiving a single injection, however, there occurred, within ten days after vaccination, as already mentioned, five cases which Dr. Bailey regarded as suspicious of yellow fever, and, still later, five more suspicious cases. Of the latter patients, three died and came to necropsy, but the diagnosis of yellow fever was not definitely confirmed. During the same period 181 cases of yellow fever occurred among the nonvaccinated population (Chart 3).

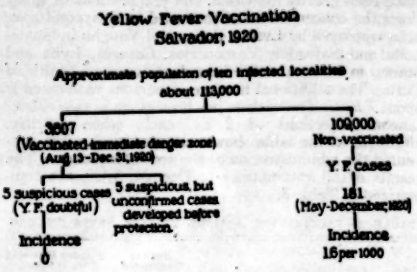

Chart 3.—Yellow fever vaccination, Salvador, 1920.

In Guatemala, in the small town of Los Amates, with about 660 inhabitants, there were twelve cases of yellow fever from June to August, 1920. Vaccination was begun in August, and 617 vaccinations were carried out between August 20 and August 30. No case of yellow fever developed among the vaccinated, and only one among the few left unvaccinated at Los Amates. The remainder of the nonimmune population was vaccinated, September 18, after which date no further case occurred. At Virginia one case of yellow fever was discovered, September 7, and the entire population (350) was vaccinated, September 26-27. No further case occurred. In Quirigua and Puerta Barrios, although no cases of yellow fever had occurred, 105 persons were vaccinated. No case of yellow fever developed. The total number of vaccinations in Guatemala was 1,383, and 138 persons received two injections (Chart 4).

In Tuxpan, Mexico, with about 6,000 inhabitants, eighty-six cases of yellow fever occurred during a period of thirty-nine days from Aug. 20 to Oct. 7, 1920, a morbidity rate of 14 per thousand. Vaccination was begun, October 7, and during the subsequent twenty-nine days (October 7 to November 5) 2,000 non-immune persons were vaccinated, among whom seventeen contracted yellow fever within from one to ten days after vaccination. No other cases developed among the vaccinated during the epidemic period, which ceased in December, 1920. On the other hand, during a period of eighty-five days (October 7 to December 31) ninety-five cases occurred among the unvaccinated group, forty-five of them between October 7 and November 21, and twenty-one between November 22 and December 31. Hence the morbidity rate among the 4,000 vaccinated during the period of eighty-five days was 28 per thousand. The fact that no cases of yellow fever occurred among vaccinated persons after the lapse of two weeks following vaccination, while the epidemic had remained unabated in intensity, as shown by the incidence among the unvaccinated during the same period, seems to indicate a definite protective effect of vaccination (Chart 5).

In the small town of Tambogrande, in northern Peru, with 500 inhabitants, two isolated cases of yellow fever occurred. Forty-seven persons in the neighborhood of the primary focus were subsequently vaccinated (Dr. Valcárcel). Within two weeks after vaccination, eighteen new cases arose among the villagers; one of these persons had been vaccinated, but only ten days previous to the onset of disease.

COMMENT

It is understood that vaccination constituted only a part of the campaign against yellow fever, and in all these localities it was carried out simultaneously with the antistegomyia campaign. Just what part the vaccination played in checking the further spread of the disease is therefore not easily estimated; but one fact stands out, namely, that practically all persons vaccinated escaped yellow fever, notwithstanding the opportunities for infection to which both vaccinated and unvaccinated were alike exposed under otherwise identical conditions, as shown by the fact that during the period of ten days following vaccination before the protective effect of the vaccine could have developed, the number of victims of yellow fever among vaccinated and unvaccinated was equally great. Vaccination, which protects the nonimmune person from infection, is a valuable weapon in itself, but it does not supplant the method of elimination of yellow fever by the antistegomyia campaign.

SUMMARY

The transmission of yellow fever from man to guinea-pigs and the isolation of *Leptospira icteroides* have been repeatedly accomplished by various workers in the course of different epidemics; in Guayaquil by Noguchi (1918); in Merida and Peru by Noguchi and Kligler (1919-1920); in Piura by Gastiaburu (1919); in Vera Cruz by Perez-Grovas (1920) and by Le Blanc (1921).

Anti-icteroides serum reduces the mortality in yellow fever when used on or before the third day of the disease. Of 170 cases, ninety-five have been treated on or before the third day, with thirteen deaths (13.6 per cent. mortality), while the average death rate of untreated patients during these epidemics has been 56.4

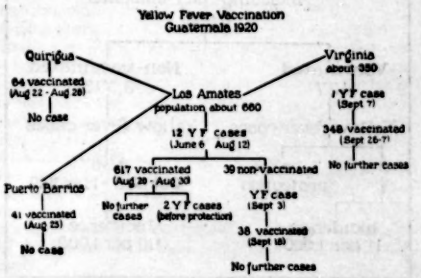

Chart 4.—Yellow fever vaccination, Guatemala, 1920.

per cent. (442 deaths among 783 cases not treated with serum). On the other hand, treatment with serum after the fourth day has no appreciable effect, since there were thirty-nine deaths among seventy-five cases (52 per cent. mortality).

Prophylactic inoculation by means of the injection of 2 c.c. of the killed culture of *Leptospira icteroides* (containing at least 2,000,000,000 organisms per cubic centimeter) is of definite protective value. Among 3,230 persons vaccinated twice, no case of yellow fever developed, while 278 cases occurred among the non-vaccinated (Guatemala, Salvador, Tuxpan) notwithstanding the fact that both groups of individuals were equally exposed to infection. Among 4,307 persons receiving only a single inoculation of the vaccine, only five suspicious cases (Salvador) developed.

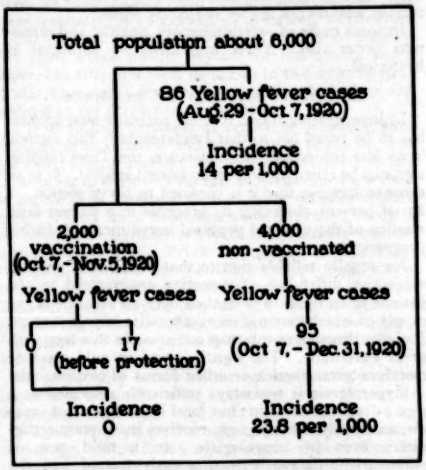

Chart 5.—Yellow fever vaccination, Tuxpan, Mexico, 1920.

The protection resulting from vaccination does not become effective until about ten days after the last injection, as shown by the frequent case incidence occurring among the vaccinated population within from one to ten days after they were vaccinated. There were twenty-three such cases among 7,537 persons who were vaccinated with the standard vaccine.

NOTE.—The records of vaccination and serum treatment presented here comprise the work of a number of observers. For statistics from Central America I am indebted first to Dr. Theodore C. Lyster and Dr. Wenceslao Pareja, and then to Dr. Charles A. Bailey (Salvador) and Dr. Emmett I. Vaughn[12] (Guatemala); for the records of Mexican cases to Dr. A. B. Vasconcelos[13] and Dr. Graham Casasús of the Consejo Superior de Salubridad, and to Dr. Diego Hernandez of the Junta de la Sanidad de Yucatan; also to Dr. T. J. Blanc of the staff of the Rockefeller Institute, who has been working in Vera Cruz; the Tuxpan statistics were furnished by Dr. W. J. Lynn and Dr. Guadarrama; the work in Ecuador and Peru was done with the cooperation and assistance of the Ecuadorean and Peruvian health authorities.

12. Dr. Lyster and his associates are intending to present their own experiences in a paper to be prepared by them.

13. Dr. Vasconcelos's details regarding results in Mexico are soon to appear in print.

SUBJECTIVE SIGNS IN DIAGNOSIS*

TOM A. WILLIAMS, M.D.
WASHINGTON, D. C.

This paper is designed to show that subjective sensations of patients have a validity not inferior to the facts which are denominated objective in contradistinction. It is customary to deride what is called subjective, i. e., what we learn by the revelations of the patient about himself even when elicited by examination. By ignoring these data failure is courted, of which scores of examples could be adduced. The reason of this derision of the subjective is largely a confusion on the part of the examiner between the actual subjective feelings of the patient and a very different phenomenon, viz., the interpretation the patient places on these feelings, which is very often extremely erroneous, as all of us know.

But patients are not the only sinners in this respect, for the history of medicine is crammed with fallacious interpretations of objective signs, such as the appearance of a bacillus, the nature of a chemical reaction, the significance of a pathologic process. Even today the fallacious interpretation of the Wassermann reaction still occasionally occurs. It is only yesterday that there was an almost general refusal to think of tabes as syphilitic, although the objective pathologic appearance of the spinal roots were unequivocally so. Even now, in many minds, a special validity is implicitly attributed to signs requiring laboratory procedures, as against signs ascertainable at the bedside without chemicals or registering apparatus.

There is a tendency in our profession toward besetments. In the main the inductive process is put to sleep. Thus, when a medical man finds a microbe amid the facts, it grows and grows till it becomes the macrocosm of his consciousness. In another man a chemical reaction is all dominant. In a third, it is the registering apparatus which impedes his thinking. To the three slaves of the objective must be added that acolyte of the psyche, who is allied to these objectivists through an acquired faculty of discerning abstruse psychologic reactions in his patients. To paraphrase an ancient proverb, "He cannot see the wood because of the rabbits in it." He is no different from the first three physicians; for, although the signs he deals with are called subjective, yet to him they are just as much objective data as a reflex, a chemical reaction, a difference of percussion, etc. And they are indeed objective, the error not being one of clinical fact but one of the clinician's interpretation by besetment by one who is intoxicated by the exuberance of his own "psychosity."

In what are called the psychoneuroses, of course, it is in the subjective aspects that entire reliance has to be placed; for in these individuals there is to be found nothing but what the patient himself reveals. However, nowadays, only the most reactionary dare deny the pragmatic power of the psychotherapist to bring well-being to the thousands of people who are sociologically inefficient and personally miserable

* Read before the Section on Nervous and Mental Diseases at the Seventy-Second Annual Session of the American Medical Association, Boston, June, 1921.

† In medical nomenclature the sign is taken as a manifestation elicited by the examiner, and of which the subject does not complain. A symptom is looked on as that of which the patient is conscious and can complain, and the word "subjective" is used in contrast to the word "objective" to mean that which, while felt by a subject, cannot be directly verified by an examiner, while objective is looked on as verifiable. According to these definitions, the title "Subjective Signs" is a contradiction in terms.

because of sufferings entirely without the signs regarded as objective. It is quite true that to this thesis there are still objectors who continue to present trite facts illustrating the principle that an undetected disturbance of the body may produce discommoding psychologic symptoms which may be regarded erroneously as psychogenic, which symptoms disappear as soon as the disorder of the body is rectified. Such an instance was that of the psychasthenic forester whose growing inability to deal with his official subordinates might have been attributed to prolonged absence from his family and the anxieties contingent thereupon. Having, however, an adequate acquaintance with psychasthenic characters, I did not fall into this error, but fell into another by attributing the state to the kind of physical inadequacy induced by the poor adaptation to the sedentary life in an office after being years in the field. The real interpretation was revealed by the extraction of an inflamed tooth, after which immediate relief occurred. Such instances might be multiplied indefinitely; and it is to facts of this nature that must be attributed the prevalance of the treatment of neurotic states by such empiric procedures as oophorectomy, turbinectomy, tenotomy or refractive corrections, suspension of the colon, manipulation of the spine or orthopedic adjustment, all of which are good in their right place, but very bad when applied empirically without an adequate diagnosis, the lack of which is so often due to the ignoring by the physician of subjective signs.

FALLACY OF ATTRIBUTION TO ORGAN

In neurology proper, perhaps the most conspicuous example of the exceeding value of subjective signs is furnished by the sensation of numbness, more especially when this is intermittent and widespread. These are the very qualities to which it has been the fashion to attribute fallaciousness and to regard as the products of imagination, hysteria. In reality, these attributes indicate oscillation in the physical state, at the period when changes are so impalpable as to escape diagnosis by our present objective methods, a state which reveals itself solely by these subjective signs. I refer to the incipiency of the changes in the spinal cord concomitant with the disorder known as pernicious anemia. Many of these patients present for years numbness or tingling in the fingers or toes without any suspicion arising of blood changes, and possibly without the objective signs which we require in establishing disease of the spinal cord. I have yet to see a case, however, in which these were absent when it came to examination, but I have never seen a case which has not had a long history of the subjective signs of which I speak, long anteceding my examination. For example:

> A man, aged 61, referred by Dr. Thompson. Two years ago, numbness of thumb and toe after dancing, followed by girdle sensation and gradual numbing of hands a year and a half ago. Progressive difficulty in walking. Great weakness. Examination: reflexes feeble, Achilles and arms absent. Left cremaster absent. Left abdominal feeble. Plantar flexion fair. Pupils active. Prick felt. Deep pain diminished in L. quadriceps, and R. hamstrings and calf, and L. radius. Vibration absent below L. 5; diminished in lumbar spine. Spacing fair. Finger to finger slow and inaccurate. Speech thickened. Diagnosis: spinal sclerosis from pernicious anemia. Blood count confirmed this. Treatment has improved him.

In another case numb feelings in the fingers had existed for over six months without any significance being attached to them. But in this case even when difficulty in walking occurred no suspicions were aroused and a fantastical diagnosis of arterial constriction was supposed to account for the incapacity. Examination quickly revealed the sclerosis of the spinal cord and led to a diagnosis of an idiopathic anemia. In still another case even a young neurologist attributed to hysteria a patient's relation of paresthesiae characteristic of alterations of structure. Examination quickly showed a sclerotic spinal cord.[1]

Paresthesias at the roots of the limbs characterize lesions in the thalamic region. They are frequent in encephalitis and have again been adjudged hysterical in cases without paralyses, especially if emotional disturbances are prominent. This error is avoided by clinicians who do not ignore subjective signs.

In some cases of arteriosclerosis, tingling and numbness occur also. Never must they be adjudged as hysterical.

SENSATIONS PROVOKED BY EXAMINER

In investigating these, too, the patient's own account has to be relied on, so that fundamentally this method is no less subjective. For instance, the Tinel tingling sign can be relied on only in an honest subject. It is an error to suppose that it is confined to nerve section. I am at present observing its progress in a patient with sciatica of the external popliteal nerve incurred during pregnancy.

An equally reliable sign to that of Tinel is another subjective difference of sensation experienced by the patient when the skin is stroked over an area the nerve supply of which may not seem otherwise impaired at all. Patients themselves can map out areas in this way with great exactitude. The sign is found in mild cases of meralgia paraesthetica or other forms of neurodocitis.

Hyperalgesia is nowadays sufficiently esteemed as a sign as regards the skin; but local hyperalgesia of muscle, an equally valuable sign, receives inadequate recognition even by neurologists. In a mild case of polyneuritis, diagnosis was recently missed and the patient permitted to visit an osteopath, even though preceding diphtheria should have aroused suspicion. The earliest sign in this case was musculotendinous hyperalgesia.

But muscular hyperalgesia is even more often important in disease of the viscera. Every surgeon knows this of appendicitis and cholecystitis. It is less known regarding pulmonary inflammations. Difference in the tenderness of thoracic muscles corresponding to the spinal segment from which arises the sympathetic ramus going to inflamed areas is inadequately utilized by internists as a sign. A segmental hemihyperalgesia of this kind is a very frequent phenomenon and it may affect the cutaneous segmental distribution as well as the muscular or articular nerve supply.

These sensory signs referred from viscera are of a quite different character to the sensory symptoms caused in the course of emotional disturbances and sometimes objectivated by patients to the viscera in which they seem to be felt. Nowadays it has come to be realized, particularly concerning the stomach and sometimes the heart, that the symptom the patient emphasizes is a consequence of an emotional reaction, of which it is really a part.

It is very important to compel patients to give us a clear introspection of sensations of this kind. They may be differentiated by the absence of the peripheral

1. Williams, T. A.: The Causes of Emotivity, and Their Management, J. A. M. A. 75: 523 (Aug. 21) 1920.

hyperalgesia which occurs from direct visceral irritation. In these cases, of course, the problem is one of psycho-diagnosis and not of neurologic investigation. In both cases, however, clinical power comes only from a due appreciation of the subjective signs; and this demands of the patient precise observation, which is not so rare as some clinicians believe, along with its clear expression, which tends much more often to be clouded by conventional fallacies of nomenclature gathered by report from the body of constantly shifting popular knowledge of hygiene and symptomatology. The clinician who knows what he is about will easily direct the patient away from interpretations and set him upon recounting his observations as naively as possible.

The enumeration of occasions for the use of subjective signs would extend beyond the limits of a short paper, but attention must be drawn to two more in particular because of the frequency with which they are ignored to the detriment of patients.

I refer to the characters of recurrent headache, particularly as to situation and kind. As to headache, it is not rare for patients who have suffered for years to fail to mention it at all to a doctor, so accustomed are they to regard it as a part of themselves or insusceptible of cure.* This fallacy depends on the prevalent medical doctrine that migraine is a hereditary fatality irremediable by medical art. While the tendency is hereditary, the pathogen can be modified, the patients vastly relieved by attenuation of the severity of the headache and by great lengthening of the interval between attacks, which from weekly or almost daily ensue every few months or when infraction of prophylactic rules is indulged.

As to pituitary headache, the subjective recital of its location is often the most important angle fact in its diagnosis.

Of one other subjective sign, a word must be said—of vertigo. This is too often regarded as trifling by physicians, and the patient is neglected in consequence. Its importance was manifested in a recent striking case only because it reached the point of disorientation, so that the man was almost incapable of finding his way in the automobile. The physician regarded it at first as a psychosis, but an examination quickly showed vestibular and oculomotor signs which indicate a lesion, which was then placed in the subthalamic region. The pathogen syphilis was detected and the patient vastly improved by treatment, solely because the subjective sign which led to a diagnosis incommoded him so intensely.

Countless are the cases of vertigo indicative of cerebral arteriosclerosis, neoplasm and syphilitic endarteritis when diagnosis is reached only after irreparable damage has occurred because adequate significance is not attached to the condition by clinicians who habitually fail to take account of subjective signs.

Teaching Unit of Tuberculosis.—A proper teaching unit should afford the fullest facilities for theoretical and practical instruction in all aspects of the tuberculosis problem. And these facilities should be available not only for the student, but also for the practitioner of medicine. To the latter they should be available in the form of short, carefully planned, intensive, postgraduate courses, to which every inducement should be given for his attendance. Now that the treatment of tuberculosis is so rapidly being taken over by the state it would be a sound and wise policy if these postgraduate courses were not only available free of all cost, but also that the graduate student were boarded and lodged free of expense.—H. Gauvain, *Brit. J. Tuberc.* 15:3, 1921.

THE SERIAL QUANTITATIVE METHOD OF CULTURE IN THE STUDY OF RESPIRATORY DISEASE*

ARTHUR L. BLOOMFIELD, M.D.
BALTIMORE

Of all the regions of the body, none offer more difficulties to bacteriologic study than do the upper air passages. After more than thirty years of investigation the cause of the large and ever present group of infections included under the designation of colds, grip and influenza is still unknown, and even the significance of the various organisms found in association with these conditions is but little understood. Yet this is not surprising when one considers the conditions existing in the upper air passages—a region of great anatomic complexity occupied by a profuse normal flora which is constantly modified by the entry and exit of extraneous organisms. A more detailed analysis of the difficulties presented by respiratory bacteriology shows that they may be grouped under several heads.

DIFFICULTIES

Technical.—The initial collection of representatives of all varieties of organisms present in the upper air passages is by no means simple. Even with the most careful swabbing many areas must be neglected, and organisms lurking in tonsil crypts, crevices of the mucous membrane, in the sinuses and in the deeper nasal passages may be passed over. The crudity of the swab method may be readily demonstrated by making cultures from the same individual at brief intervals, using a technic as nearly as possible constant, and seeing the difference in the proportions of the bacteria obtained. But even if all varieties of organisms present adhere to the swab in their true proportions, distorted results may be obtained owing to the technicalities of mediums and of plating. The usual plate culture from the throat shows a more or less confluent mass of growth from which the various kinds of bacteria are isolated with considerable difficulty. Under the best of conditions slowly growing and delicate organisms may be largely or entirely overgrown by the more hardy flora, and bacteria present in only small numbers must often be overlooked. This fact is readily illustrated by comparing the number of pneumococcus carriers demonstrable by culture and by the more delicate method of mouse inoculation.

Interpretative.—With the actual results of the culture before him, the examiner faces the problem of interpretation, which is by no means simple. One must decide in the case of each organism whether it is a normal inhabitant, or whether it is being carried without having any special pathologic significance, or whether it bears a definite relation to present or recent disease.

CRITICISMS OF METHODS IN GENERAL USE IN STUDYING RESPIRATORY DISEASE

Even a superficial examination of the literature on respiratory diseases makes it clear that various workers have obtained quite contrary results. In the case of colds, for example, a wide variety of organisms[1]

* From the Biological Division of the Medical Clinic, Johns Hopkins University and Hospital.

1. Bloomfield, A. L.: Variations in the Bacterial Flora of the Upper Air Passages During the Course of Common Colds, Bull. Johns Hopkins Hosp., to be published.

have been incriminated, such as *Micrococcus catarrhalis*, staphylococci, streptococci of various sorts, and influenza bacilli. In attempting to explain these contradictions, the following points may be suggested: (1) Differences in the manner of collecting material. Here we find that the methods, while in the main similar, differ in detail. Some workers have swabbed various areas in the upper air passages, others have used expectorated material or nasal washings. (2) Differences in mediums. Wide variations in results may follow the use of different mediums. The remarkable discrepancies in the reported incidence of influenza bacilli in the throat are clearly due to this cause. (3) Variations in technic of plating. This is a point of special importance. The usual method of rubbing or streaking the swab over the surface of the plate yields a confluent growth in which one or another in one culture may be different from that of thousands of colonies of this organism recovered repeatedly from the same individual over a long period of time. To see whether the problem could in any way be simplified, we have employed a serial quantitative method of culture in normal individuals and in cases of respiratory disease the results of which we wish to outline now.

Methods.—A cotton swab is passed systematically over the soft palate, both tonsils, and the posterior pharyngeal wall as high as one can reach. This swab is then rubbed over the surface of the plate of medium. With a bent glass rod the organisms are spread uniformly over the surface of the plate. The same rod, with whatever bacteria adhere to it, is then rubbed over a second and a third plate. In this way a discrete growth of colonies is obtained which allows

TABLE 1.—PROTOCOL OF NORMAL PERSON (CASE 9, ER.)*

Date of Culture	Nonhemolytic Streptococcus	Gram-Negative Cocci	Hemolytic Streptococcus	Pneumococcus	Influenza Bacillus	Staphylococcus Albus	Meningococcus	
Mar. 4	∞	∞	0	0				
Mar. 9	∞	50	0	0	0	0	0	A gram-positive diphtheroid, many colonies
Mar. 16	∞	∞	Alpha type, many colonies	Type IV, many colonies	0	0	0	A coarse, gram-positive coccus, many colonies
Mar. 25	∞	∞	Alpha type, many colonies	0	100	0	0	
Apr. 5	∞	∞	0	0	A few	0	0	
Apr. 13	∞	∞	0	0	0	0	0	Several hundred colonies of a gram-negative bacillus; large gray colonies, with hemolysis
Apr. 16	50	Many	0	0	0	0	0	Many colonies of a coarse, gram-positive coccus, not S. albus
Apr. 20	∞	∞	0	0	Many	3	0	50 colonies of same gram-negative bacillus as found in culture of April 13
Apr. 25	∞	∞	0	0	Many	0	0	

* The normal flora is present. In addition, influenza bacilli and other bacteria were transiently present. A mild pharyngitis lasting two days preceded the appearance of the alpha hemolytic streptococcus recovered on March 16 and March 25.

TABLE 2.—PROTOCOL OF A CASE IN WHICH THERE WAS A SIMPLE RESPIRATORY INFECTION (CASE 1, SL.)*

Date of Culture	Nonhemolytic Streptococcus	Gram-Negative Cocci	B. Influenzae	Hemolytic Streptococcus	Pneumococcus	Comment	Clinical Notes
Jan. 4	∞ At least two varieties	∞	100 colonies (hemolytic)	0	0	Many colonies of a minute, gram-positive organism; a few colonies of S. albus	Cold began, January 2; nose occluded, throat raw; tonsils removed; nasal and pharyngeal mucous membranes reddened
Jan. 7	∞	∞	Many colonies (hemolytic)	0	0	.....	Convalescent
Jan. 10	∞	∞	0	0	0	A few colonies of S. albus	Well

* Clinically, the case was one of an uncomplicated cold. The members of the normal flora—nonhemolytic streptococcus and gram-negative cocci—were present in large numbers in all the cultures. Staphylococcus albus was present in small numbers in the first and third cultures. In the first culture there were many colonies of a minute, gram-positive organism. Hemolytic influenza bacilli were present in the first two cultures. Our impression of the bacteriology of this case is that we are dealing with the normal flora plus transient insignificant organisms, such as one finds in healthy controls.

organism may appear to predominate to the practical exclusion of others. (4) The number of cultures made. In most of the reported work, single cultures have been made. Thus, one obtains at best only a cross-section view of conditions, without being able to say anything about the sequence of events. (5) Special interest in one or another organism. Most observers have been interested in the special relation of a particular organism to some disease condition. This attitude has often led to unjustifiable etiologic assumptions, as will be shown below.

THE SERIAL QUANTITATIVE METHOD

In considering the methods outlined above, two outstanding deficiencies are apparent: first, the lack of data as to the relative numbers of organisms present, and, second, the fact that as a rule only single cultures are made. It seems, for example, that the significance of a single colony of *Staphylococcus albus* recovered accurate quantitative estimation of the number of organisms present, as well as easy fishing of colonies for further study. In our work both rabbit-blood agar and oleate hemoglobin agar have been used. These mediums are suitable for all of the usual organisms found in the throat—staphylococci, streptococci (both hemolytic and nonhemolytic), influenza bacilli, hemolytic influenza bacilli, diphtheroids, the gram-negative cocci, and others. Cultures are taken at frequent intervals from the same individual during the course of the disease or during the period of study, and the results compared qualitatively and quantitatively.

RESULTS

1. *Healthy (Normal) Individuals.*—A series was studied[2] by this method to determine, if possible, the

2. Bloomfield, A. L.: The Significance of the Bacteria Found in the Throats of Healthy People, Bull. Johns Hopkins Hosp. 32: 33 (Feb.) 1921.

normal constant flora of the throat. It seemed that with this as a background the findings in disease could be much more readily interpreted. It was found that the organisms recovered from the throats of healthy persons by this method fall into two groups: (1) A true normal flora constantly present in all people over long periods of time consisting of the gram-negative cocci, and nonhemolytic streptococci. To this perhaps may be added certain diphtheroids. The exact status of the influenza bacillus and the pneumococcus is still in doubt, but these organisms cannot yet be regarded as members of the normal flora in the strict sense, although they are frequently harbored by healthy people. (2) A transient flora consisting of both pathogenic and nonpathogenic bacteria which are present normally for only a short time in the same individual. This group is discussed more at length below. An illustrative protocol will serve to emphasize these points (Table 1). It will be seen that the subject constantly harbored gram-negative cocci and nonhemolytic streptococci. Other organisms were present merely as transients. Had only a single culutre been made, for example on March 16, much stress might have been placed on the hemolytic streptococcus recovered on that day, whereas the series of cultures brings out the true relation of this organism to the basic flora.

2. *Respiratory Infections.*—A series of cases of common colds was studied in a similar way.[3] In simple, uncomplicated cases, as illustrated by Table 2, the findings were essentially those which are obtained in normal people. It has been possible, therefore, reasonably to conclude that none of the ordinary pathogens which have been regarded as the cause of colds are really the primary cause, but that some other infectious agent must be sought. This fact could not have been demonstrated without serial quantitative cultures. On the other hand, in cases of colds featured by a clinical complication, such as bronchitis, or a sinus infection, it was often possible to show that a particular organism was the cause of the complication because of its coincident advent and disappearance (Table 3).

3. *Tonsillitis.*—The method was then applied to cases of acute follicular tonsillitis (Tables 4, 5, 6 and 7). In this disease we have an entirely different picture featured by the presence of B hemolytic streptococci, which persist during the active stage of the disease and for a variable length of time thereafter. In two cases, observations were obtained shortly before

TABLE 2.—PROTOCOL IN A COLD COMPLICATED BY TRACHEITIS (CASE 8, BL.)*

Date of Culture	Nonhemolytic Streptococcus	Gram-Negative Cocci	B. Influenzae	Hemolytic Streptococcus	Pneumococcus	Comment	Clinical Notes
Dec. 21	∞	∞	0	0	0	Several hundred colonies of a coarse, gram-positive coccus; 15 colonies of a yellow staphylococcus	Third day of cold; nose stuffy, throat raw; malaise and chilliness; for one day, tracheitis with thick, green, purulent sputum
Dec. 29	∞	∞	0	0	0	A few colonies of a coarse, gram-positive coccus; 15 colonies of a yellow staphylococcus	Practically well; throat still a little raw; slight cough with mucoid sputum
Jan. 8	∞	∞	0	0	0	Many colonies of a yellow staphylococcus	Well; still very slight throat catarrh
Sputum culture Dec. 21	0	0	0	0	∞	Many colonies of a coarse, gram-positive coccus	

* Clinically, the case is one of a cold complicated by a severe tracheitis. The normal flora was constantly present. Two organisms which are not normally present in the throat were obtained—a yellow staphylococcus, and a coarse, gram-positive coccus. From the sputum a pneumococcus was obtained in almost pure culture. This organism was clearlyassociated with the tracheitis.

TABLE 4.—PROTOCOL IN A CASE OF ACUTE FOLLICULAR TONSILLITIS (CASE BA.)*

Date of Culture	Nonhemolytic Streptococcus	Gram-Negative Cocci	B. Influenzae	Hemolytic Streptococcus	Pneumococcus	Clinical Notes
Jan. 20	0	∞	0	∞ (B. type)	0	Onset, January 20: high fever; sore; huge red tonsils, covered with exudate
Jan. 21	Many	∞	0	∞ (B. type)	0	Condition unchanged
Jan. 24	∞	∞	Many colonies (hemolytic)	A few colonies (B. type)	0	To normal; tonsils still large and red, but no exudate
Jan. 29	Many	∞	Many colonies (hemolytic)	Many (B. type)	0	Feels well; tonsils still a little large, but perfectly clean and pale
Feb. 10	∞	∞	0	0	0	Well

* This case shows predominance of hemolytic streptococcus during active stage of disease, with disappearance later and return of normal flora

TABLE 5.—PROTOCOL IN A CASE OF ACUTE FOLLICULAR TONSILLITIS (CASE SP.)*

Date of Culture	Nonhemolytic Streptococcus	Gram-Negative Cocci	Hemolytic Streptococcus	B. Influenzae	Pneumococcus	Clinical Notes
Jan. 11	0	Many	∞ (B. type)	0	0	Onset January 11, with sore throat and fever (to 101); on examination: large swollen tonsils with exudate
Jan. 13	0	20 colonies	∞ (B. type)	0	0	Tonsils still large and red, patches subsiding
Jan. 15	0	Many colonies	∞ (B. type)	0	0	Temperature normal; throat clear
Jan. 17	Many colonies	Many colonies	Many colonies (B. type)	0	0	Well
Jan. 19	A few	40 colonies	∞ (B. type)	....		
Jan. 25	∞	∞	Many colonies (B. type)	0	0	
Feb. 1	Many	∞	(B. type)	A few colonies (hemolytic)	0	

* Same general findings as in previous case. Flora at first practically replaced by hemolytic streptococcus, gradually returning as streptococcus decreases. Convalescent carrier state persisting during period of observation.

the onset of the disease at a time when the hemolytic streptocci were not yet present. Study of these cases by this method brings out, therefore, the important fact that the occurrence of B hemolytic streptococci when persistently present indicates present or past infection with this organism. Proof of a chronic carrier state except under these conditions is still lacking. A case of scarlet fever and one of influenza were also studied illustrating the relation of the streptococcus to the throat flora in those diseases.

COMMENT

It is apparent from the foregoing observations that the significance of the presence of a given organism in the throat may vary under various conditions. In the light of present knowledge, one or another of the following explanations may apply:

A. The organism may be a member of the constant normal throat flora.

B. The organism may be a member of the normal flora of some other part of the body (skin, intestine) which has been introduced into the throat.

C. The organism may be an extraneous one which has been introduced into the throat.

D. The organism may have become established in a local focus of disease in the upper air passages.

E. The organism may be one which is the cause of and is associated with the presence of an acute disease.

A. *The organism may be a member of the normal constant throat flora.*

In previous papers evidence was brought to show that the free surfaces of the normal mucous membranes of the upper air passage usually afforded a very unfavorable environment for the colonization and growth of extraneous bacteria, as they were promptly washed away by the secretions.[3] It appeared that a focus of diseased tissue usually was necessary for such organisms to breed in, and that from such a focus they were discharged over the free surfaces. The question naturally arose as to whether there was a true normal mouth flora—namely, bacteria which live out their whole life history on the free mucous surfaces of the upper air passages, requiring no disease to aid them in colonizing. Study of the flora of clinically normal throats, as pointed out above, showed that certain varieties of bacteria were constantly present in large numbers. Working with aerobic methods, such organisms were found to belong to the groups of gram-negative cocci and nonhemolytic streptococci. These organisms are present so uniformly and in such large numbers that, until evidence is brought to the contrary, we are inclin ed to believe that the free surfaces of the normal mucous membranes afford them a suitable habitat and that no focus of disease as an accessory factor is necessary in explanation of their presence. Anaerobic or other special methods may reveal still other organisms to be members of the normal flora.

B. *The organism may be a member of the normal flora of some other part of the body (skin, intestine, etc.) which has been introduced into the throat.*

Extension of bacteriologic study to the various regions of the body has revealed, in each, certain

TABLE 6.—PROTOCOL IN A CASE OF ACUTE FOLLICULAR TONSILLITIS (CASE WA.)*

Date of Culture	Nonhemolytic Streptococcus	Gram-Negative Cocci	Hemolytic Streptococcus	B. Influenzae	Pneumococcus	Comment	Clinical Notes
Jan. 11	A few	Many	∞ (B. type)	A few colonies (hemolytic)	0	.....	Onset, January 9, with chill and fever (102); no sore throat until January 11; examined January 11: red throat; large tonsils with exudate
Jan. 13	A few	Many	∞ (B. type)	20 colonies (hemolytic)	0	.....	Tonsils still large and red; patches subsiding
Jan. 15	Many	....	∞ (B. type)	A few colonies (hemolytic)	0	.....	Throat clear; no patches; tonsils look normal
Jan. 17	Many	....	A few colonies (B. type)	0	0	.....	Well
Jan. 20	A few	....	A few colonies (B. type)	0	0	.....	Well
Jan. 25	A few	....	A few colonies (B. type)	0	0		
Feb. 1	Many	....	20 colonies (B. type)	0	0		
Feb. 8	....	....	Many colonies (B. type)	0	0	A few colonies of a small gram-positive diphtheroid	

* The striking feature is the presence of an extraneous organism (B. hemolytic streptococcus) associated with the tonsillitis. During the active stage of the disease this organism practically replaced the normal flora. The patient continued to carry it during the period of observation, although in somewhat smaller numbers, with coincident increase in normal flora.

TABLE 7.—PROTOCOL IN A CASE OF ACUTE FOLLICULAR TONSILLITIS (CASE F.)*

Date of Culture	Nonhemolytic Streptococcus	Gram-Negative Cocci	Hemolytic Streptococcus	B. Influenzae	Pneumococcus	Comment	Clinical Notes
Mar. 12	Many	∞	∞	A few (hemolytic)	0	A few colonies of a coarse gram-positive diphtheroid	Just over a mild follicular tonsillitis; today throat looks a little red and he complains of soreness
Mar. 14	Many	∞	∞	2 colonies (hemolytic)	0	A few colonies of a gram-positive diphtheroid	Well
Mar. 16	Many	Many	∞	0	0	A few colonies of a gram-positive diphtheroid; 1 colony S. aureus	
Mar. 18	Many	∞	∞	0	0	1 colony S. albus	
Mar. 29	Many	Many	Several hundred colonies	0	0	6 colonies of a gram-negative spore-bearing bacillus; 6 colonies S. albus	

* Culture made on March 4 showed no hemolytic streptococcus but innumerable hemolytic influenza bacilli. With onset of tonsillitis the streptococcus became the dominating organism, a carrier state persisting.

For previous papers see footnote 3.

3. Bloomfield, A. L.: The Upper Air Passages as an Environment for Bacterial Growth, Am. Rev. Tuberc. 4: 247 (June) 1920.

organisms which are more or less constantly present. The general nature of the intestinal flora is well known, and the presence of the white staphylococcus on the skin, and of diphtheroid bacilli in various parts of the body has been frequently demonstrated. These organisms may at times be recovered in cultures made from the throat, but serial cultures (see above) made in the same individual show their presence not to be constant, as in the case of the true normal flora, but to be transient. They may be present for from one to a few days but then usually disappear, perhaps to reappear later. In general, they behave as do foreign organisms experimentally introduced into the upper air passages: they disappear rapidly, as they do not colonize, but are promptly washed away by the mouth secretions. We believe, therefore, that these organisms when present in the throat are there as transients introduced from time to time by means of contact with some other part of the body, but that they do not actually colonize. Under certain disease conditions to be discussed below, these organisms may be present over longer periods of time.

C. *The organism may be an extraneous one which has been introduced into the throat.*

Under the ordinary conditions of extensive contact which exist among groups of individuals, a variety of extraneous bacteria, both nonpathogenic and potentially pathogenic, are constantly entering the upper air passages. At the same time the flora of healthy people, even when exposed to respiratory disease, remains surprisingly constant.[3] Clearly the organisms introduced, even if pathogenic, are as a rule disposed of without colonizing or producing disease. Were this not so, every one would soon harbor many types of germs, and the incidence of such diseases as pneumonia would be general unless the race as a whole became immune. It seems on the basis of the experimental[4] work that the most important protective mechanism of the upper air passages is the flushing action of the secretions by which the majority of foreign organisms are disposed of. Such organisms may therefore be recovered from the throat in health (Table 1); but serial cultures are necessary to distinguish a transient harboring of the germ from an actual carrier state.

D. *The organism may be one which has become established in some local focus of disease in the upper air passages.*

This state of affairs obtains most commonly in the so-called carrier state in which an organism not a member of the normal flora may be harbored in the throat for long periods of time. Differential cultures made with a view of determining the seat of growth of the bacteria have shown in many carriers of hemolytic streptococci, diphtheria bacilli, meningococci, Friedländer bacilli and other germs that the organisms were breeding in a local focus of diseased tissue, such as the tonsils, nasopharyngeal lymphoid tissue, or a paranasal sinus. It was possible, furthermore, to prove in the case of Friedländer bacillus carriers[5] that the organisms failed to colonize on the free mucous surfaces of the upper air passages but were discharged solely from a local focus of infection in the tonsil. In every isolated instance of a carrier of an extraneous organism, one should therefore think of this possibility as being very likely.

E. *The organism may be the cause of and associated with the presence of an acute disease.*

TABLE 8.—PROTOCOL IN A CASE OF SCARLET FEVER (CASE BU.)*

Date of Culture	Nonhemolytic Streptococcus	Gram-Negative Cocci	Hemolytic Streptococcus	B. Influenzae	Pneumococcus	Comment	Clinical Notes
Jan. 24	∞	∞	Many (B. type)	0	0	.....	Onset, January 22, with sore throat, fever, etc.; typical scarlet fever rash on following day; January 24, typical scarlet throat; temperature 101
Jan. 28	∞	∞	10 colonies (B. type)	0	0	.....	Temperature, normal; throat not sore, but still a little red
Jan. 31	Many	∞	Very many (B. type)	0	0	A few colonies S. albus; a few colonies small gram-positive diphtheroid	Desquamating; throat clear
Feb. 9	Many	Many	Very many (B. type)	0	0	A few colonies small gram-positive diphtheroid	Convalescent
Feb. 15	Many	Many	Very many (B. type)	0	0	A few colonies S. albus	

* Bacteriologically, the changes are the same as in acute tonsillitis.

TABLE 9.—PROTOCOL IN A CASE OF INFLUENZA (CASE E.)*

Date of Culture	Nonhemolytic Streptococcus	Gram-Negative Cocci	Hemolytic Streptococcus	B. Influenzae	Pneumococcus	Comment	Clinical Notes
Feb. 6	Many	∞	Many	0	0	.....	Onset, February 5; typical symptoms of influenza; throat diffusely red; tonsils not swollen; no exudate
Feb. 7	∞	∞	Many	0	0	.....	Feels very bad; general aching, fever; throat diffusely red
Feb. 9	∞	Many	A few colonies	0	0	A few colonies of a huge gram-positive coccus	Convalescent; throat still raw and red
Feb. 18	∞	∞	A very few colonies	0	0	A few colonies of a gram-positive diphtheroid	Well
Mar. 21	∞	∞	0	0	0	2 colonies S. albus; a few colonies of a gram-positive diphtheroid	Well
Mar. 31	∞	Many	A few colonies	A few colonies (hemolytic)	0	∞ colonies S. aureus.....	Well

* About twenty cultures made previously in this individual failed to show hemolytic streptococci. It seems certain, therefore, that the presence of this organism followed the present acute infection. After seven weeks the subject still carries hemolytic streptococci in small numbers.

4. Bloomfield, A. L.: The Fate of Bacteria Introduced into the Upper Air Passages, Bull. Johns Hopkins Hosp. 32:14 (Jan.) 1921.

5. Bloomfield, A. L.: The Mechanism of the Bacillus Carrier State, Am. Rev. Tuberc. 4:847 (Jan.) 1921.

In acute diseases whose portal of entry is through the upper air passages, the causal organism may be found during the course of the disease in cultures made from the throat. Pneumonia, typhoid fever, tonsillitis, meningitis and diphtheria may be mentioned as outstanding examples. In these cases the extraneous organism is superimposed on the normal flora.

CONCLUSION

My purpose in this paper is to show, by quoting the work thus far done, the futility of single qualitative cultures in respiratory disease, and to emphasize the importance of the serial quantitative method. Extensive use of this method may eventually make clear the relation of the bacteria found in the throat to acute and to chronic disease, it may aid in solving the question of primary and secondary invaders, and it may give leads to rational vaccine therapy by enabling one to pick out the offending organism with greater accuracy.

EXPERIMENTAL MEASLES *

FRANCIS G. BLAKE, M.D.
AND
JAMES D. TRASK, Jr., M.D.
NEW YORK

It is a well recognized fact that measles, especially in children under 5 years of age, is one of the most serious of the acute infectious diseases because of the severe and not infrequently fatal complications to which it leads. The failure to prevent the spread of measles by quarantine and the inadequate control of its complications by isolation and symptomatic treatment have suggested that a more hopeful solution of the problem might be found in prevention by prophylactic inoculation. This is of course by no means a new idea. It was attempted as long ago as 1758 by Home [1] and as recently as 1913 by Herrman,[2] who attempted to immunize infants between 4 and 5 months of age when they were relatively immune, apparently with some success.

Since it seemed probable that a more satisfactory basis for the ultimate development of a practical method of prophylactic inoculation could be obtained by animal experimentation than by other methods, a study of experimental measles in monkeys was undertaken. The conflicting result reported by previous workers in this field made it necessary at the outset to establish beyond doubt the susceptibility of the monkey to the virus of measles. Our preliminary experiments, therefore, were undertaken with this immediate end in view, and they have served mainly to confirm the original contention of Anderson and Goldberger [3] that the monkey is susceptible to measles. The results of these experiments have been published [4] recently. In brief, it has been shown that monkeys (*Macacus rhesus*) injected intratracheally with unfiltered or filtered (Berkefeld N) nasopharyngeal secretions from cases of measles in the prodromal or early eruptive stage of the disease react after an incubation period of from six to ten days with a group of symptoms closely resembling those of measles in man, namely, drowsiness, conjunctivitis, photophobia, Koplik spots, enanthem, exanthem, leukopenia and frequently fever. The lesions in the monkey have been shown to be essentially identical with the corresponding lesions of human measles as described by Mallory and Medlar.[5] Briefly, they consist of a proliferative and exudative reaction about the capillaries in the upper layers of the corium. The exudate consists of serum and large mononuclear phagocytes or endothelial leukocytes. These cells appear to be derived from the swollen and proliferating capillary endothelium, and are in a state of active multiplication as indicated by numerous mitotic figures. The exudate invades the epithelium of the hair sheaths and epiderimis, where it forms minute vesicles or vesicopustules. The vesicles in the epidermis rapidly dry up and give rise to minute, thickened plaques which desquamate as scales. The lesions of the buccal mucosa are similar in character, except that the epithelial lesions (Koplik spots) go on to maceration and shallow surface erosion instead of drying up to form scales.

The disease has been transmitted readily from monkey to monkey through a considerable number of generations by suspensions of skin and buccal mucosa prepared from monkeys killed shortly after the appearance of the exanthem; by nasopharyngeal washings collected during the prodromal period; by citrated whole blood, defibrinated whole blood and by serum injected intravenously, subcutaneously or intratracheally; and by intimate contact infection. Finally, it has been shown that one attack of experimental measles confers an active immunity against reinfection.

With these facts established, our efforts have been turned toward an attempt to develop a method of prophylactic inoculation against the experimental disease. In order to vaccinate successfully against measles, it seems probable that a living virus will have to be employed, as in the case of smallpox. If so, this presumably will require modification of the virus of measles so that it will produce on inoculation only a local and not a general infection. Modification or attenuation of a virus may theoretically be accomplished by animal passage or by subjection of a potent "fixed" virus to deleterious influences of chemical or other nature.

A preliminary experiment having shown that the blood of an infected monkey was infective for other monkeys from the last day of the incubation period to the second day of the exanthem, it was thought possible that by repeated transfer of the infection with large amounts of blood collected during this period, the virulence of the measles virus for the monkey might be enchanced until a potent "fixed" virus was obtained The outcome of two such series of passages, however, was quite the reverse, and repeated transfer resulted in attenuation of the virus so that after from eight to twelve passages it was no longer capable of inducing the experimental disease. In the first series of passages, two or three successive bleedings of from 6 to 10 c.c. each, collected on the second, third, and fourth days of the disease in the donor monkey were employed. Beginning with the fifth passage, the experimental disease began to decrease in severity until the thirteenth

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* From the Hospital of the Rockefeller Institute for Medical Research.
* Read before the Section on Diseases of Children at the Seventy-Second Annual Session of the American Medical Association, Boston, June, 1921.

1. Home, F.: Medical Facts and Experiments, Edinburgh, 1759.
2. Herrman, C.: Arch. Pediat. **32**: 503, 1915.
3. Anderson, J. F., and Goldberger, J.: Pub. Health Rep. **26**: 847, 887, 1911.
4. Blake, F. G., and Trask, J. D., Jr.: J. Exper. Med. **33**: 385, 413, 621, 1921.
5. Mallory, F. B., and Medlar, E. M.: J. M. Res. **42**: 327 (March) 1920.

passage, when further passage failed. In the second series of passages a single bleeding of 10 c.c. collected on the first or second day of measles in the donor monkey was used with a similar result, the ninth passage failing in this series. Passage of measles from monkey to monkey by contact infection, while successful in early passages, has also failed as yet to provide a method for continuously propagating the disease in monkeys. The reasons for this gradual diminution in the infectivity of the measles virus for monkeys are obscure, and it will require much further experimentation to elucidate them.

Since these experiments, however, provided us temporarily with an attenuated virus, it seemed desirable to determine whether intracutaneous injection of small amounts of this virus might not result in a local reaction without evidence of a general infection. In preliminary experiments, which are not as yet sufficiently complete to warrant any definite conclusions, it has been found that a virus attenuated by animal passage, if injected intracutaneously in small amount, will produce a local reaction without evidence of a subsequent general infection. The local reaction is characterized by a cutaneous edema of from twenty-four to forty-eight hours' duration, which is followed in some cases by a local exanthem limited to the skin adjacent to the site of inoculation. If the area of skin showing the reaction is excised, minced and ground in salt solution, and the resulting suspension injected intracutaneously in another monkey, a similar local reaction may occur. It has also been found that similar results may be obtained by the intracutaneous injection of an originally potent virus which has been attenuated by preservation in glycerol in the icebox. Whether monkeys so inoculated will consistently develop an active immunity against infection is as yet uncertain. That they may, in certain instances, possess an effective immunity against infection with a potent virus is indicated by experiments now in progress, but not yet sufficiently complete to be reported in full.

ABSTRACT OF DISCUSSION

DR. JOHN F. ANDERSON, New Brunswick, N. J.: It is an interesting coincidence that Dr. Blake should present his paper on experimental measles before the same organization just nine years after Dr. Goldberger and I presented a summary of our work on the same subject. A critical reading of the seven papers by Dr. Goldberger and myself, and the three papers by Drs. Blake and Trask will show that our earlier work has been repeated and confirmed in every essential point by their later work, although as yet Drs. Blake and Trask have not reported on some phases of the subject covered by us, among which may be mentioned the period of infectiousness of the nose and throat washings, noninfectiousness of the scales, and resistance of the virus to various physical and chemical agents, nor have they reported infection by contact of young monkeys when placed in cages with monkeys sick with measles. It is of interest that Drs. Blake and Trask stated that the evidence we had presented of the production of measles in the monkey was not entirely conclusive, owing, possibly, to the fact, as stated by them, that we had not reported Koplik spots (though Lucas and Prizer did), blood counts and histologic studies of the skin, although it is safe to advance the opinion that but few physicians require such aids in the diagnosis of measles in the human being before measles is pronounced.

DR. CHARLES HERRMAN, New York: There is no doubt that Dr. Blake has added new evidence to this subject, although Drs. Anderson, Goldberger, Hektoen and others have already proved conclusively that the discharges from the nose and throat and the blood of patients with measles were infectious, and that the disease could be produced experimentally in human beings and in monkeys. Dr. Blake's investigations are still more conclusive and have put the subject on a still firmer basis. Many years ago I became convinced that with our present methods the spread of measles could not be controlled, and that such a control was possible only by means of immunization against the disease applied in early infancy. In 1913, I began the inoculation of infants, immunizing them against measles. The method was based on the following facts: 1. It is definitely known that the discharges from the nose and throat, the mucus, in the active stage of the disease, that is, just before and while the eruption is beginning to appear, contains the virus of measles; it is not necessary to know what that virus is, or how to identify it under the microscope. 2. In large cities, where practically all mothers have had measles, a relative immunity is conferred to the offspring through the placental circulation. This immunity is absolute during the first two months and gradually disappears. In infants inoculated between 4 and 5 months of age, the relative and temporary immunity might be converted into an immunity which would last for at least a few years. 3. The infectious material is usually conveyed from the nasal mucous membrane of the patient to the nasal membrane of the individual infected. So that would be the way in which artificial infection could take place. With these facts in mind, the nasal mucus of children with measles who were otherwise free from disease, at the beginning of the stage of invasion when the eruption was beginning to appear, was collected on small swabs or drawn into small capillary tubes, which were sealed. This mucus was applied by touching the nasal mucous membrane of healthy infants between 4 and 5 months of age. One hundred and fifty infants have been thus inoculated; of these, twenty-five are definitely known to have come in intimate contact with patients with measles, and only two have contracted the disease.

DR. HENRY F. HELMHOLZ, Rochester, Minn.: Digkovitz, reporting from Pfaundler's clinic in Munich, showed that 173 individuals who had been exposed to measles and had been injected with 5 c.c. of the serum of convalescent patients, taken between the seventh and the fourteenth day after the temperature dropped to normal, had had absolute protection against the disease. We were able to repeat these experiments in ten instances where the child stayed right in the home with the infected individual, and the child was protected against measles. I think this is of great importance, and certainly during epidemics makes available a means of protecting children during the dangerous period from 1 to 4 in which the mortality is so exceedingly high.

DR. DENNETT L. RICHARDSON, Providence, R. I.: About four or five weeks ago Dr. O'Connor and I inoculated seventy-five children with serum from convalescent measles patients. The inoculated children have been more or less definitely exposed to measles, and in no case has any child developed measles.

DR. FRANCIS G. BLAKE, New York: We have not made a detailed study of the period of infectivity of which Dr. Anderson spoke, but we have confirmed his observations that, in monkeys, inoculations with secretions collected during the prodromal period of the disease have always been infective. When the secretions were collected on the first day of the exanthem, transmission has usually been successful; but failures have occurred when the secretions were collected later in the disease. The reason for going into the susceptibility of the monkey to measles was not that we had any doubt that Anderson and Goldberger had been successful in showing that the monkey was susceptible to the disease, but in order to clear away doubts that had arisen from the negative results reported by Sellards and other workers. The principal thing that we felt to be lacking in the final demonstration was the pathology; and, as Dr. Anderson said, the pathology of measles at the time he did his experiments was not sufficiently well described. I have followed with a great deal of interest the literature with regard to passive immunity. No doubt, the method offers a good procedure in epidemics, and one cannot help but think that something might have been accomplished in the army if that procedure had been applied.

PREPANCREATIC AND PERIPANCREATIC DISEASE

WITH A CONSIDERATION OF THE ANATOMIC BASIS OF INFECTION FROM THE GALLBLADDER TO THE PANCREAS *

JOHN B. DEAVER, M.D.
AND
J. E. SWEET, M.D.
PHILADELPHIA

I. PREPANCREATIC AND PERIPANCREATIC DISEASE

By JOHN B. DEAVER, M.D.

In the majority of diseases of the upper abdomen, the symptoms are sufficiently well defined to permit of a rather close approach to diagnosis in a large number of instances. Probably the most prominent exception in this respect is the pancreas. At the same time this organ is so often involved in pathologic conditions of the viscera surrounding it and even in disease of more remote regions, and direct attack on the pancreas is as yet fraught with so much danger, that a proper consideration of prepancreatic and peripancreatic disease as forerunners of acute or of chronic pancreatitis becomes of vital importance. For, in these days, when preventive medicine occupies so conspicuous a place in the medical forum, it behooves the surgeon also to concentrate attention on conditions which make for preventive surgery. It is for this reason that I am willing once more to express my views on this subject.

The most frequent forerunner of disease of the pancreas is some affection of the gallbladder or the bile passages, which is frequently, but not always, associated with calculi. Extension of such an inflammation mainly by way of the lymphatics gives rise to lymphadenitis along the course of the common duct and its lymphatics in the right free border of the gastrohepatic omentum, and to a peripancreatic lymphangitis and lymphadenitis with enlargement and hardening of the adjacent portion of the pancreas itself. Not alone from the gallbladder and the bile passages, however, does the pancreas become involved; but very often such involvement forms part of the pathology of gastric and duodenal ulcer. Although the pancreas itself is resistant to the action of the gastric juice, it may form part of the base of a gastric ulcer, and its lobules can frequently be seen lying free in the base of the ulcer, although the inflammatory process is most liable to produce thickening of the interstitial tissues and hardening of the surface of the organ. The possibility of perforation of such an ulcer, with the danger of acute pancreatitis added to the already threatening condition, must be kept in mind. The serious effect on the pancreas of chronic ulcer of the duodenum is a familiar story to those who have occasion to treat a considerable number of these ulcers. A recent experience at the Lankenau Hospital forcibly demonstrated this possibility with all its inherent serious consequences.

REPORT OF CASES

The patient came to operation with a typical ulcer history, extending over a period of two years. At operation, the ulcer, with much induration, was found on the second portion of the duodenum, with inflammatory adhesions between the duodenum and the pancreas. The adhesions were separated, and amputated below the site of induration, and with the pylorus excised the head of the pancreas was sewed over the duodenal stump.

The postoperative course was very stormy. Evidence of secondary collection developed, and a second operation, performed on the fifteenth day, revealed acute hemorrhage pancreatitis with fat necrosis studding the pancreas and the omentum; also plastic exudate and pus under the liver. Free drainage was instituted. The condition failed to improve, and a third intervention was undertaken five days after the second. The incision was made into the left loin space from which pus and particles of pancreatic tissue exuded. After washing out the cavity, drainage tubes were introduced. There was no connection between the cavity and the original opening. The patient did well after this, and two weeks later was discharged to the care of her physician, with the wound not entirely healed.

This patient, unfortunately, died three months later of symptoms of an intercurrent pulmonary tuberculosis. Her physician reported to the follow-up clinic, that the wound had healed well and that there was no evidence of a return of gastric symptoms.

The basis of this stormy postoperative course was without doubt the duodenal ulcer, the contributing cause being the adhesions that had formed between the duodenum and the pancreas, and possibly also trauma to the pancreas at operation. One such occurrence is all that is needed to point the lesson of early attention to symptoms of upper abdominal disease, especially those, which, like cholecystitis and ulcer, are marked by chronicity more or less prolonged.

The appendix also may be a feature in peripancreatic and pancreatic inflammation through the retroperitoneal path. This avenue of infection is illustrated in at least two cases, previously reported.

One was a girl who came to operation with symptoms of acute gangrenous appendicitis accompanied by chills and fever. The appendix was removed, but the chills and fever persisted and acute abdominal symptoms developed necesitating a second operation. At the latter, a small abscess was found completely encapsulated in the mesentery of the ileum. The pancreatic lymph glands were enlarged and the pancreas itself greatly swollen and edematous. Death occurred ten days after the second operation. At necropsy no other lesion was found except the pancreatic lymphangitis above referred to.

The second case was also one of acute appendicitis with chills and fever. The appendix was removed, a few adhesions were found; but there was no pus. Seventeen days after operation, the patient developed signs of secondary collection, and at reoperation a large mesenteric abscess was drained. Death occurred five months later. Necropsy revealed multiple abscesses of the liver, chronic periappendicular peritonitis, acute congestion of the spleen and kidneys, suppurative cholecystitis, and abscess at the head of the pancreas.

The anatomic basis for this theory of the lymphatic route of infection is set forth by my co-worker, Dr. J. E. Sweet, professor of research in surgery at the University of Pennsylvania.

II. THE PASSAGE OF INFECTION FROM THE GALLBLADDER TO THE PANCREAS

By J. E. SWEET, M.D.

The problem of pancreatitis is the old problem of abdominal surgery: Where does the provocative agent come from? It would not make much difference about the theory if we could only agree on the correct procedure in practice. The final test of all theory is the

* Read before the Section on Surgery, General and Abdominal, at the Seventy-Second Annual Session of the American Medical Association, Boston, June, 1921.

facts of practice; and if these facts do not conform to the theory, we will simply have to alter the theory, we cannot change the facts.

In order to understand the problem, it is necessary to assemble all the information we have, and to weigh the interrelations of these facts; to start at the very beginning, with the embryology of the organ.

Fig. 1.—The development of the pancreas.

The pancreas arises, as do all the organs of the gastrointestinal tract, as an out-pouching, or out-budding, from the wall of the primitive gut, like a glove finger pushing out from the inside of the wall. The hollow of this bud or finger, forms the final duct; the cells at the end grow and develop into the secreting cells, the acini of the gland.

The pancreas anlage appears later than the liver anlage; the common duct has already developed. Three different buds,[1] apparently, go to form the pancreas; one dorsal bud from the wall of the gut nearer the stomach, from which the greater part of the pancreas, the body and tail, develops. Two ventral buds arise in close proximity to the common duct, sometimes growing out from the wall of the duct itself. Of these two ventral buds, one seems to disappear, perhaps forming the source of the aberrant glands often found along the gut wall (Fig. 1).

The close relationship between this portion of the pancreas and the common duct is thereby explained. Depending on the eccentricities of development, the relationship will vary somewhat; the common duct may be entirely surrounded by pancreatic tissue; pancreatic tissue may occur in the wall of the common duct itself.

This relation of the exact point of origin of the persisting ventral bud to the common duct determines the final relation of the main pancreatic duct to the common duct. If the pancreas anlage has grown out from the wall of the common duct itself, the finished pancreatic duct will open into the ampulla of the common duct; if the pancreas anlage has grown out from the wall of the gut itself, in close proximity to the common duct, the openings of the ducts will be in close proximity, yet the pancreatic duct may really open into the intestine and not into the ampulla at all.

This development of the ducts must be clearly borne in mind, for from it there arises a peculiar arrangement of affairs which must be considered. Yet it is not considered, either by the adherents of the theory of duct-borne infection, or by the surgeon who seeks to drain the pancreas through the gallbladder.

The facts seem to be these: Both buds develop by growth in continuity, the dorsal bud giving origin to by far the greater part of the gland, namely, all of the gland except that portion of the head in close proximity to the common duct and the intestinal wall. The persisting ventral bud grows out but a little way, then fuses with the tissue developing from the dorsal bud, giving origin to but a small part of the glandular tissue. In the majority of cases, the duct system of this anlage becomes the more important duct system from the point of fusion of the two anlages to the wall of the gut.

This somewhat complicated developmental history results in the possibility of great variations in the final arrangement of things. The relation of the common duct and the pancreatic duct to each other and to the intestine will vary, according to the relation of the original ventral anlage to the common duct and to the intestinal wall. Four types of papillae of Vater are consequently described[2] (Fig. 2). It is evident that an infection coming down the common duct could gain entrance to the pancreas in the first type, possibly in the third; certainly not in the second and fourth. A small stone could block the opening, allowing bile to be forced into the pancreas, as in Opie's classical case, in Type 1, perhaps in Type 3, certainly not in Types 2 and 4. Increased pressure in the biliary apparatus would tend to close Type 3, and would make no difference in Types 2 and 4. It is doubtful whether the type pictured as Type 1 occurs very often; the usual picture, when the duct of Wirsung opens into the side of the common duct, is that of a fold of mucous membrane covering the opening, somewhat like the manner in which the ureters open into the urinary bladder.

But I would respectfully suggest that the determination of the finer anatomy of the papilla is a matter to be decided by the pathologist at the necropsy table, rather than by the surgeon at the operating table.

This complicated manner in which the duct system of the pancreas develops toward the final form results in further situations which must be borne in mind by the operating surgeon. In a study of 100 subjects, Opie[3] found two ducts in every instance; but occasionally one or the other was so small that it was found with difficulty. In ten of the 100 cases, the two ducts failed to anastomose with the gland, and in four additional cases, the two ducts were united

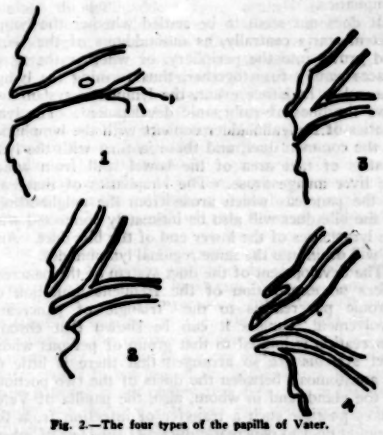

Fig. 2.—The four types of the papilla of Vater.

1. Hamburger: Anat. Anz. 7:707, 1892.

2. Letuelle and Nattan-Larrier: Bull. Soc. anat. de Paris, 1899, p. 987.

3. Opie: Am. Med. 8:966, 1903.

by such a minute twig that they might be regarded as independent of each other. In fourteen per cent. of the cases, then, the transfer of infection from the common duct to the entire pancreas is out of the question.

In twenty instances, the duodenal end of the duct of Santorini was not patent, and in a considerable number of specimens, the orifice of the duct of Santorini, though patent, was so minute that its functional significance was slight. In these cases, then, the entire gland could have been involved from the common duct, provided the type of papilla would have permitted. Unfortunately, Opie did not include a description of the finer anatomy of the papilla of Vater.

In eleven of the 100 cases the duct of Santorini was equal in size to, or greater than, the duct of Wirsung, so that during life it was doubtless the outlet for a considerable, if not the larger, part of the pancreatic juice.

Of the 100 cases, then, ten showed no union of the ducts; four a very minute union; and eleven showed a duct of Santorini of equal importance with the duct of Wirsung. Twenty-five per cent. of the cases could not be infected throughout the entire gland from the gallbladder; and in twenty-five per cent. of the cases, conversely, the pancreas could not possibly be drained through the gallbladder.

Now the condition of chronic pancreatitis is most frequently limited to the "triangle of pancreatic involvement"—the tissue arising from the ventral anlage. But let us not be too hasty in claiming that the arrangement of the ducts explains this, and proves the theory of duct-borne infection; for the manner of development of the pancreas will also determine the distribution of another structure of the organ, namely, the lymphatics.

It does not seem to be settled whether the lymph system starts centrally, as outbuddings of the veins, and grows into the periphery, or whether the tissue spaces simply fuse together, thus forming the lymph channels. In either event, the lymphatic system follows the lines of embryonic development. The lymphatics of the gallbladder connect with the lymphatics of the common duct, and these in turn with the lymphatics of that area of the bowel wall from which the liver anlage arose. The lymphatics of that part of the pancreas which arose from the neighborhood of the bile duct will also be intimately connected with the lymphatics of the lower end of the bile duct. And all will drain into the same regional lymphnodes.

The development of the duct system of the pancreas offers no explanation of the frequent limitation of chronic pancreatitis to the "triangle of pancreatic involvement," unless it can be shown that chronic pancreatitis is limited to that group of persons whose duct systems are so arranged that there is little or no anastomosis between the ducts of the two portions of the gland, and in whom, also, the papilla of Vater makes possible such a transfer of infection from the common duct to pancreatic duct. If the laws of inheritance and of survival of the fittest hold true of the pancreas, it would seem that such unfortunate individuals would have dropped out of the running, ages ago!

ROUTES OF INFECTION

But the development of the lymphatic apparatus does afford an explanation, for the embryology determines the course and the interrelations of the lymph system, and therefore explains the tendency of chronic pancreatitis to limit itself to the duodenal portion of the gland. For this route, only infection is necessary; an individual would not need to have been cursed by ancestors, careless of the relations of their ducts.

A consideration of the embryology leads to another conclusion. The ducts and acini are directly related; the cells at the end of the outgrowing bud form the secreting cells; naturally, too, the secreting cells must be in intimate relationship to the ducts, since the product of these cells is poured into the ducts. Infected bile forced up the ducts would, therefore, first, involve the secreting cells, causing an acute involvement of the acini. These destroyed acini may be replaced by connective tissue giving the picture of sclerosis. But chronic pancreatitis does not usually show signs of primary destruction of the secreting cells, nor does the clinical history point to any such acute condition; and if this is the route followed, infectious organisms are certainly brought to the pancreas. What becomes of them?

Archibald [4] argues that the lymph route cannot be at fault because the pancreas is rarely the seat of bacterial inflammation. But we will show in a moment that the lymphogenic theory is the only one that can explain the absence of organisms. According to the duct theory, organisms must be in the infected bile; the adherents of this theory fail to explain what has become of them.

How shall the problem be solved? To our minds, the final solution will depend upon a careful study of necropsy material, with a very careful study of the ducts. If pancreatitis can be shown to occur under circumstances in which the anatomy makes a so-called ascending infection impossible, then we will have to admit another route; if these findings show that a majority of cases occur under circumstances wherein the ducts could have carried the infection, then the duct may stand accused; provided, however, that it is shown that those cases limited to the "triangle of pancreatic involvement" are thus limited because the duct systems fail to anastomose within the gland, and provided further that some one will explain what becomes of the bacteria in those cases in which the bile is certainly infected.

Animal experimentation has led to an impasse. The latest experiments by Archibald seem to him to show the passage of infection along the ducts; yet any one could interpret the same experiments as proving the lymphatic course as well, for in every one of his experiments he found an enlarged, congested lymph gland at the head of the pancreas. He states that "these glands are found acutely swollen, obviously as the *result* of the pancreatic lesion," even while he reports in Cat 89, "two large, swollen lymph glands, obviously inflamed . . . microscopic sections showed nothing abnormal in the pancreas."

Archibald is inclined to discredit the lymphogenic route because it would be a retrograde process, and because suppurative processes are not characteristic of pancreatic involvement. Yet he fails to consider that an infection of the regional lymph nodes might well cause a simple damming back of lymph, with aseptic swelling of the interstitial tissue, later organization and increased interstitial tissue, which is precisely the picture of chronic pancreatitis, and which explains why infectious organisms are not found.

4. Archibald: Surg., Gynec. & Obst. 28:529 (June) 1919.

Archibald explains the effectiveness of cholecystectomy by hazarding the guess that the operation removes the only muscular force of any strength in the biliary system. But, unfortunately, the operation of cholecystectomy is followed by a general dilatation of the ducts, which must mean that there has been an increase of pressure; therefore, if cholecystectomy is of value, it must be because Archibald is wrong. If he is correct, the removal of the gallbladder should accentuate the pancreatitis, because the pressure in the biliary system is increased. Unfortunately for his theory, such is not the case.

If the papillae of Vater were always so arranged that infection could enter the pancreas from the bile passages, which they are not; if the ducts were always so arranged that infection could involve the pancreas through the duct of Wirsung, which they are not; if cases of chronic pancreatitis showed clinical symptoms which might be ascribed to transitory attacks of limited acute pancreatitis, with later transformation of the degenerated acini into sclerosed areas, which they do not; if cholecystostomy, with prolonged drainage, could always drain the pancreas, which it cannot; if cholecystostomy, with prolonged drainage, ever did more than might be ascribed to the drainage of the gallbladder, which it does not; if cholecystectomy, which causes dilatation of the biliary passages, this dilatation showing increased pressure, aggravated the condition supposed to have been caused by increased pressure due to the spasm of the muscle of Oddi, which it does not; then we might be led to tinker with the papilla of Vater. But I propose, in view of these facts, to continue to think of chronic pancreatitis as a lymphangitis, secondary to a focus of infection in the wall of the gallbladder; and as surgeons have always done and always will do, I shall continue to remove the focus of infection and cure the condition.

RELATION OF THE LIVER AND THE PANCREAS TO INFECTION OF THE GALLBLADDER*

EDWARD STARR JUDD, M.D.
ROCHESTER, MINN.

Cholecystitis is nearly always associated with a certain grade of hepatitis or pancreatitis, or both. The degree of inflammation in the liver and in the pancreas is often so slight that it is recognized with difficulty. Cholecystitis does not always mean that the infection in the liver and pancreas will also be severe. In certain cases, the disease seems farther advanced in the liver or pancreas than in the gallbladder, suggesting that it was primary in the liver or pancreas and secondary in the gallbladder. It is possible that infection may progress in this manner; nevertheless, all the evidence indicates that the infection is primary in the gallbladder. Graham [1] has recently called attention to the intimate association between the gallbladder and the liver through the lymphatics, and has suggested that in certain cases the gallbladder may be infected through the lymphatics from the liver. A study of these lymphatics was made by Sudler [2] some years ago, but their importance in relation to cholecystitis and hepatitis has not been realized until recently.

The gallbladder, as a part of the excretory mechanism of the liver, is brought into relationship with the liver through the bile ducts. Thus it is possible, although not likely, for infection in the hepatic tissues to reach the gallbladder by way of the bile stream. Infection might pass through one viscus to the other through the venous system.

The gallbladder and the pancreas are also associated through the lymphatics and the bile ducts. It has been shown that the efferent lymphatics from the gallbladder and those from the pancreas anastomose around the head of the pancreas; and it has been further suggested that this is the reason why this part of the gland is most often invaded (Maugeret [3]). Deaver [3] believes that chronic pancreatitis in the majority of cases is due to the invasion of the substance of the gland by way of the lymph channel. He calls this condition pancreatic lymphangitis and says that it precedes interstitial pancreatitis. He believes that the source of this infection is the infected bile and the diseased gallbladder, and in a few cases, gastric and duodenal ulcers.

Opie,[4] Meltzer [5] and Mann [6] have shown that the bile entering the pancreatic duct under certain circumstances results in an inflammation of the gland similar to that of interstitial pancreatitis. Several years ago, Archibald [7] called attention to the fact that bile might be forced into the pancreatic duct as a result of the spasmodic contraction of the sphincter muscle at the end of the duct. He further suggested that remedies to overcome this would relieve the pancreatitis. Knowing that removal of the gallbladder cures most patients who have cholecystitis and pancreatitis, Mann and I removed the gallbladders from animals in order to study the changes which occurred as a result of the loss of this organ. Apparently there was an attempt to compensate for the loss of the functions of the gallbladder. The first change was dilatation of the common duct, and the second, paralysis of the sphincter at the entrance of the duct into the duodenum. This seemed to explain why removal of the gallbladder relieved inflammation in the pancreas, if it were due to an influx of bile, the result of a spasmodic condition of the sphincter muscle. If it were due to an extension of infection from the gallbladder through the lymphatics, then, naturally, removal of the infected gallbladder would afford relief.

The mechanism of the excretory apparatus of the liver is not altogether understood. The gallbladder seems to have several important functions, and yet when it is destroyed or removed, these are well compensated by changes in the bile ducts, and in the operation of the control sphincter at the end of the common duct. So far as we can determine, no serious consequences follow loss of the gallbladder. We have many patients under observation from whom the gallbladder was removed years ago, and nothing abnormal can be detected, no gross or microscopic changes in the liver or pancreas result.

* Read before the Section on Surgery, General and Abdominal, at the Seventy-Second Annual Session of the American Medical Association, Boston, June, 1921.

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2. Sudler, M. T.: The Architecture of the Gallbladder, Bull. Johns Hopkins Hosp. 12: 126-129, 1901.

3. Maugeret, quoted by Deaver, J. B.: Surgical Anatomy, Philadelphia, P. Blakiston's Son & Co. 2: 816, 1903.

4. Opie, E. L.: Disease of the Pancreas, Philadelphia, J. B. Lippincott & Co., 1903.

5. Meltzer, S. J.: The Disturbance of the Law of Contrary Innervation as a Pathogenetic Factor in the Diseases of the Bile Ducts and the Gallbladder, Am. J. M. Sc. 153: 469-477, 1917.

6. Mann, F. C.: Personal communication.

7. Archibald, E.: Does Cholecystenterostomy Divert the Flow of Bile from the Common Duct? Canad. M. A. J. 2: 557-562, 1912.

ENTRANCE OF BILE INTO PANCREATIC DUCTS

It has been shown that pancreatitis may result from the injection of bile into the pancreatic duct. Mann has recently performed a series of experiments to determine the conditions under which bile must enter the ducts in order to produce this change in the gland. He divided his work into several studies and investigated

TABLE 1.—CHOLECYSTITIS WITH PANCREATITIS—FORTY-EIGHT CASES

	Years
Average age of patients	42
Oldest	66
Youngest	22
Longest duration of symptoms before operation, forty years.	
Shortest duration of symptoms before operation, two months.	
	Operations
Cholecystectomy	48
Choledochostomy	15
Appendectomy associated with other operations	35
Gastro-enterostomy associated with other operations	2
Oophorectomy associated with other operations	1
Condition Found at Operation	**Cases**
Jaundice	9
Stones in the gallbladder	46
Stones in the common duct	8
Regional lymphatics enlarged	6
Cholecystitis, Grade 1	0
Cholecystitis, Grade 2	32
Cholecystitis, Grade 3	12
Cholecystitis, Grade 4	4
Hepatitis, Grade 1	1
Hepatitis, Grade 2	0
Hepatitis, Grade 3	2
Hepatitis, Grade 4	0
Abscess of the liver	2
Pancreatitis, Grade 1	28
Pancreatitis, Grade 2	19
Pancreatitis, Grade 3	1
Pancreatitis, Grade 4	0
Data Obtained from Recent Letters of Inquiry	
Cured (attacks of diarrhea in 3)	30
Unimproved	2
No reply	16

the cause or causes of pancreatitis, both acute and chronic, with reference to the bile. He found that in the goat, the pancreatic duct empties directly into the common bile duct, several centimeters from the entrance of the latter into the duodenum. This offers an ideal natural anatomic condition as a means of determining whether there is a physiologic mechanism which can, under sufficient pressure, force bile into the pancreatic duct and produce pancreatitis. Accordingly, the common bile ducts in five goats were doubly ligated and sectioned distal to the entrance of the pancreatic duct, and the animals were allowed to live for various lengths of time. None developed acute pancreatitis and none died from the effects of the bile being forced into the pancreatic duct, although bile was forced into the pancreatic duct as was easily demonstrated in two animals that lived for three or four weeks after the operation. In both, the pancreas was stained greenish throughout, and the pancreatic ducts were dilated and filled with a greenish fluid. On abrasion of the pancreatic surface, bile could be forced through by pressure on the gallbladder; and while the pancreas showed well-marked pancreatic changes, the changes simulated more nearly those following duct occlusion than those following the injection of bile. Many observers have demonstrated that in a large number of experiments, the injection of bile into the pancreatic duct with a syringe produces acute hemorrhagic pancreatitis. However, injecting a fluid such as bile with a syringe under very high pressure, causes a definite trauma to the gland. Mann, therefore, conducted experiments to determine the maximum pressure that could be developed in the common bile duct.

The pressure in the common bile duct is due to three factors: the secretory pressure of the liver, the contractile pressure of the gallbladder, and the mechanical pressure on the liver and biliary ducts by the abdominal muscles and the diaphragm. The maximum pressure produced in the common bile duct, the result of a combination of all these factors, was studied, and attempts were made to analyze the component parts of each. The experiments were performed on dogs with permanent biliary fistulas; that is, through an especially devised technic the common bile duct was transplanted to the skin and the pressure recorded by passing a catheter into the common duct and connecting by means of a "T" tube to a straight glass tube and the pressure then recorded in terms of millimeters of bile. The animals thus operated on and studied were quite comfortable, and many observations were made extending over long periods. These observations demonstrated:

1. The secretory pressure of the liver is seldom greater than 350 mm. of bile.

2. The contractile pressure of the gallbladder is difficult to estimate; but in no instance could it be determined that it was any greater than the maximum secretory pressure of the liver. As a matter of fact, it is questionable whether the gallbladder ever contracts and produces pressure greater than 300 mm. of bile. There seems to be no doubt that the gallbladder has a contractile mechanism exerting pressure on the biliary tract; but the contractile power of its own intrinsic muscle has been greatly overestimated.

TABLE 2.—CHOLECYSTITIS WITH CIRRHOSIS—THIRTY-ONE CASES

	Years
Average age of patients	46
Oldest	70
Youngest	29
Average duration of symptoms	6
Longest twenty years; shortest (papilloma of gallbladder) one month	
	Operations
Cholecystectomy	19
Choledochostomy	6
Gastro-enterostomy for duodenal ulcer associated with other operations, 1; excision of duodenal ulcer associated with other operations, 1.	
Cholecystostomy	6
Appendectomy associated with other operations	20
Condition Found at Operation	**Cases**
Jaundice	6
Stones in the gallbladder	12
Stones in the common duct	4
Cirrhosis, Grade 1	24
Cirrhosis, Grade 2	5
Cholecystitis, Grade 1	9
Cholecystitis, Grade 2	14
Cholecystitis, Grade 3	7
Cholecystitis, Grade 4	1
Pancreatitis, Grade 1	6
Pancreatitis, Grade 2	3
Pancreatitis, Grade 3	3
Enlargement of the regional lymphatics	6
Data Obtained from Recent Letters of Inquiry	
Cured	17
Not improved	2
Not heard from	12

3. The mechanical effect of the abdominal muscles and of the diaphragm on the liver is the most marked in producing changes in the intraduct pressure. Deep respiratory movements and struggling produce greater fluctuations in pressure in the common bile duct than is possible by the secretory pressure of the liver or by contraction of the gallbladder.

Thus far, Mann has found only one condition, the act of vomiting, under which the pressure in the common bile duct is greatly increased. If the animal is

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made to retch, the intraduct pressure increases enormously, reaching as high as 1,000 mm. of bile. After having determined the maximum pressure that can be exerted on the bile in the common bile duct, Mann investigated the effect of the injection with a syringe of bile into the pancreatic duct under such a range of pressures. As has been stated, if bile is injected into the pancreatic duct with a syringe, acute pancreatitis usually occurs, and quite frequently the outcome is fatal. If bile is injected under pressure of 500 mm., or a pressure greater than the secretory pressure of the liver and the contraction of the gallbladder, acute pancreatitis does not occur. If the bile is injected under a pressure of 1,000 mm., which was the maximum pressure produced in the common bile duct, namely, that produced by vomiting, acute pancreatitis may occur, although rarely. From this, Mann concludes that even if a stone or the action of the sphincter should convert the pancreatic and common bile ducts into a continuous channel, only under exceptional conditions, such as struggling or vomiting, would it be possible to inject bile into the pancreatic duct under sufficient pressure to produce pancreatitis.

TABLE 3.—CHOLECYSTITIS WITH AN ASSOCIATED HEPATITIS—FORTY-SEVEN CASES

	Years
Average age of patients	49
Oldest	69
Youngest	21
Average duration of symptoms	9
Longest, thirty-two years; shortest, three months	
	Operations
Cholecystectomy	41
Choledochotomy	6
Cholecystostomy	2
Appendectomy	25
Splenectomy associated with other operations	1
Condition Found at Operation	**Cases**
Jaundice	5
Stones in the gallbladder	22
Stones in the common duct	3
Regional lymphatics enlarged	7
Cholecystitis, Grade 1	14
Cholecystitis, Grade 2	22
Cholecystitis, Grade 3	6
Cholecystitis, Grade 4	5
Hepatitis, Grade 1 (local in 7)	22
Hepatitis, Grade 2	12
Hepatitis, Grade 3	9
Hepatitis, Grade 4	4
Liver larger than normal	3
Pancreatitis, Grade 1	7
Pancreatitis, Grade 2	6
Pancreatitis, Grade 3	1
Present condition reported by letter satisfactory	24
Present condition the same or with recurrent attacks	4
Present condition not reported	19

In order to determine whether it would be possible for the sphincter to convert the common bile duct and the pancreatic duct into a continuous channel, as has been suggested by Archibald, the sphincter at the end of the common bile duct was examined in four species in which the two ducts enter together, namely, the dog, the cat, the monkey, and man. The examination of several hundred sections of the sphincter showed clearly that in almost all instances the muscle fibers are intimately connected with both ducts so that a contraction of the sphincter will simultaneously close both the common bile duct and the pancreatic duct and will not convert them into one continuous channel. However, in two instances, both in cat and in man considerable muscle tissue has been found distal to the point of common entrance of the two ducts, so that there is a vague possibility that contraction of the sphincter might allow bile to be forced into the pancreatic duct.

The relation of the common bile duct to the pancreatic duct was studied in 170 necropsies, for the purpose of determining the percentage of instances in which the anatomic arrangement was such that it would be possible for either a stone or the action of a sphincter to convert the two ducts into one continuous passageway. This seemed a possibility in only 4.5 per cent. From these data it may be concluded that:

1. Only exceptionally is there a physiologic mechanism which can inject bile into the pancreatic duct with sufficient force to produce pancreatitis.

2. Only very exceptionally is there an anatomic arrangement whereby the ducts can be converted, either by a stone or by the action of the sphincter, into a continuous passageway permitting bile to flow from the common duct into the pancreatic duct.

3. While there is no doubt that pancreatitis is sometimes due to or associated with the passage of bile into the pancreatic duct, our data tend to support the hypothesis that the number of such instances must be exceedingly small.

If Mann's conclusions regarding the bile factor in the etiology of pancreatitis are correct it would seem that, in most cases at least, we must search elsewhere for the cause. It will most likely be found, as Deaver says, in the extension of infection to the pancreas through the lymph channels.

In this experimental work, we must take into consideration the fact that the bile which regurgitates into the pancreatic duct is normal bile and has not been changed by infection. It is possible that the infection in cases of cholecystitis changes the bile so that it readily causes trouble in the pancreas. Archibald has shown that infection reduces the protecting power of the mucus.

CHOLECYSTITIS ASSOCIATED WITH HEPATITIS

In a number of instances during operations in cases of pancreatitis, we have removed small pieces of tissue from the pancreas for study. This was done particularly if diabetes was present. Nicoll [8] carried out the same procedure in a series of cases. The information obtained thus far has not aided in studies to determine the cause of pancreatitis.

Hepatitis does not always greatly change the gross appearance of the liver and often cannot be recognized except microscopically. The liver may be slightly enlarged, although the enlargement is detected with difficulty even on careful observation. Kehr [9] estimates the enlargement as 15 per cent. and Graham [3] 87 per cent. It has seldom been observed in our cases. In some instances, there is apparently an edema in the hepatic tissues, which causes a rather rounded liver edge, but in most cases the edge is sharp. The surface in the region of the gallbladder is whiter, often mottled, with numerous white dots and lines. The inflammation of the liver is characterized by a leukocytic infiltration of the interlobular or periportal sheaths. This may progress to the stage of necrosis and fat infiltration, and in the more chronic cases may present the picture of an early cirrhosis. The clinical manifestations are not clear-cut and are probably obscured by the inflammation in the gallbladder.

8. Nicoll, J. H.: Remarks on the Frequency, Diagnosis and Treatment of Chronic Pancreatitis, Brit. M. J. 2:625-627, 1919.
9. Kehr, quoted by Graham, Footnote 3.

In our necropsy studies we have observed that hepatitis is always found in association with gallbladder and bile tract infections and is never seen in association with ulcers of the stomach and duodenum or inflammation of the appendix.

With the idea of learning the part played by inflammation of the liver, I recently reviewed the histories of 1,290 gallbladder cases in which operation had been performed in 1919. The operations were performed by ten surgeons in the clinic, and the observations on the degree of hepatitis and pancreatitis probably varied with the individual surgeon's particular interest in the conditions.

Forty-seven cases of cholecystitis with hepatitis were chosen for study. In many of these, a piece of liver tissue was excised for microscopic study at the time of the operation. There were undoubtedly many other cases of hepatitis in the series; but in some, the inflammation was so slight that it was not recognized; other cases were ruled out from this study because of complications.

A careful review of the clinical histories did not reveal anything suggesting involvement of the liver. Each contained a more or less typical history of cholecystitis. The average duration of symptoms was nine years. The longest duration was thirty-two years and the shortest three months. There were stones in the gallbladder in twenty-two of the forty-seven cases, and in the common duct in three cases. Slight jaundice was present in five cases, and without the evidence of biliary cirrhosis which is found in the obstructive cases. The gallbladder was removed in forty-one of the cases and drained in two; the common duct was also drained in six cases. The regional lymphatic glands were markedly enlarged in seven cases; they were undoubtedly somewhat enlarged in many others. The liver was estimated to be greatly enlarged in three cases. No attempt was made actually to measure the liver, and it may have been somewhat enlarged in many more cases. Both pancreatitis and hepatitis were associated in fourteen of the cases.

All of the forty-seven patients recovered satisfactorily from the operation, and we have been able to trace twenty-eight. Twenty-four are practically well, four were not greatly benefited and have since had similar attacks. It is more than one year since the operation, which would seem sufficient time for complete restoration of the liver, so it is quite probable that the present symptoms are not due to hepatitis.

Besides these forty-seven cases there were also thirty-one in which the changes in the liver had advanced to cirrhosis. The cirrhosis was not suggested by the clinical features. Pancreatitis was associated in twelve of the thirty-one cases. In spite of the diseased liver and pancreas seventeen of the eighteen patients we have traced report that they have been practically well since the operation for cholecystitis. Two patients have not thus far improved. Since the large percentage of the patients are improved as a result of the treatment, the hypothesis seems to be sustained that cholecystitis is the primary lesion and treatment for it also relieves the infection in the liver.

Of the total number of 1,290 gallbladder and bile duct cases, 347 (26.8 per cent.) had associated pancreatitis. For a comparative study of the cases of cholecystitis with hepatitis and cirrhosis, we selected forty-eight cases of cholecystitis with pancreatitis. The clinical histories in such cases do not as a rule suggest pancreatitis. The condition was determined at the time of operation by enlargement in the pancreas, more frequently in the head; in others the pancreas was generally hardened. On palpation it was found to be more firm than normal and the lobules could be felt as separate pieces of gland. Often an irregular rough surface, frequently with a sandy or shotlike feel, could also be palpated. Edema was often present. Thirty of the forty-eight patients have been well one year after the treatment of the gallbladder disease; two are not improved. No reply was received from letters of inquiry to sixteen.

Stones were present in the gallbladder in forty-six cases and in the common duct in eight. The common duct was drained in fifteen cases. While the lymphatic glands were undoubtedly enlarged in many, they were noted only in six. This does not mean that more of these cases were not cases of pancreatic lymphangitis, but simply that the lymph nodes were not large enough to attract attention.

COMMENT

1. A review of our studies inclines us to believe with Graham that cholecystitis rarely exists without hepatitis. Often the inflammation in the tissues of the liver is so slight that it is not noticed unless special effort is made to detect it. The close association of the liver and the gallbladder by the lymphatics makes extension of the infection from one to the other very easy.

2. Pancreatitis occurs frequently with cholecystitis, and as a result a definite gross change occurs in the pancreas. While it is possible that the inflammation in the pancreas may be due to the influx of bile into the pancreatic duct, Mann's recent experiments show that this does not occur except under unusual conditions. It is possible for infection to invade the pancreas by way of the lymphatics from the gallbladder, and in many cases this probably explains the source of the infection. It is apparently entirely relieved by the treatment for the cholecystitis.

3. We were unable to find in the clinical histories of patients known to have hepatitis any symptoms that were especially suggestive of the inflammation. The same may be said of the patients in whom the liver changes had progressed to a stage of cirrhosis.

4. It is possible that the incomplete relief of symptoms and the recurrences in a small number of these cases are due to inflammations in the liver or pancreas.

ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. DEAVER AND SWEET, AND JUDD

DR. ALBERT J. OCHSNER, Chicago: The conclusions in both papers seem reasonable to me. Our observations are hampered because of the condition under which we have to work. The necropsy findings are not as satisfactory as they should be. After death the postmortem changes are marked in the pancreas unless necropsy is made immediately because of the postmortem secretion and digestion. Our experimental observations are difficult and somewhat unreliable because it is quite impossible to perform these experiments with the same abnormal secretions of bile and pancreatic fluid that cause the pathologic condition in the human being. Except in case of trauma, acute pancreatitis, or thrombosis the process is a slow one. Again, in the study of the pancreas during surgical operations, the observations must be made by many different surgeons with different impressions on the examination of the same condition. Whatever we do in the way of treatment may have its effect on these conditions, but we are

practically never in position to reexamine the organ and determine what the effect has really been. There is a principle which is carried through the physiologic action of all the organs that have secretion which may accumulate to the effect that there is a marked difference in the effect of the various fluids when drainage is normal and when there is stasis. Whenever there is stasis the fluid that accumulates has an opportunity to degenerate, using degenerate in the broad sense, while the fluid in the same gland when constantly expelled normally does not have this peculiar opportunity of degeneration. This fluid, when it has degenerated because of stasis, has an entirely different effect on the organ that has secreted it from what it has after having been contaminated only in the ordinary way through the circulation. This fact interferes to a marked extent with the reliability of experimental observations. It would be unreasonable to suppose there could be direct destruction of the secreting gland cells of the pancreas by direct contact because of the character of these cells. They are located at a point at which they must be capable of exposure to an enormous amount of insult without harm to them. As a matter of fact, barring trauma, it is practically impossible to injure these cells directly because of contact with bile or pancreatic fluid; and as a matter of fact, also, the result of injury affects the glands not primarily, but only secondarily after they have become influenced by the connective tissue which is the result of long continued irritation. Irritation cannot come directly from the gland tissue, but must come from the lymphatics; and consequently my reading of the experiments of Archibald would correspond with that which Dr. Deaver has given us. Our practical conclusion must be that were there no stasis of diseased bile which through this stasis becomes dangerous, there would be no pancreatitis, except, of course, from trauma or ulceration. I have seen gastric ulcers penetrating the pancreas in the tail and body. As a matter of fact, removing the possibility of stasis, we have removed, so far as possible, the cause of the trouble.

Clinical Notes, Suggestions, and New Instruments

A NEW INSTRUMENT FOR THE ENUCLEATION OF TONSILS IN CAPSULE

DAVID L. FLANARY, M.D., ST. LOUIS

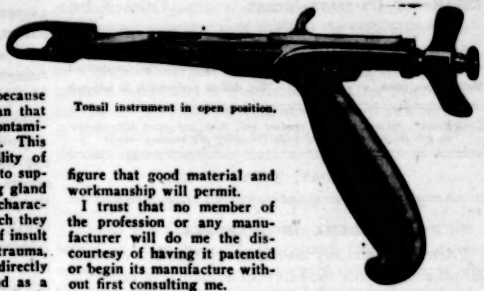
The accompanying illustration shows the instrument in the open position.

Tonsil enucleation in capsule is no new idea. The only thing new is in the mode of removal. Since the first advocate of the removal of tonsils in capsule, a number of instruments have been brought forward. Most of these instruments, in the hands of some men, did beautiful work. But as most of the instruments are used by physicians that are not ambidextrous and some of them not over strong in their hands, I felt that this instrument would make their work easier.

This instrument is held as one would an automatic pistol. On each side of the dull blade there is a thumb rest, with which to send the blade home without releasing the grip on the handle. Underneath the blade and set in the back end of the cutter-bar is a catch spring, which catches every sixteenth of an inch of the blade sent home. If, perchance, one catches a portion of the anterior pillar, or fails to engage all of the tonsil, one just touches the side of the catch spring with the thumb of the same hand that is holding the instrument, and the blade will rebound, by a spring embedded in the breast of the cutter-bar, to be sent down again by the thumb that touched the spring.

This release feature enables the operator to retain the index finger of the other hand in the mouth against the tonsil, and prevents his having to remove this finger from the mouth in order to get the blade back, when it has gone down wrong, as in the case with all other instruments. When the blade has been sent down firmly behind the tonsil with the thumb and anchored by the catch spring, it is then forced home by the propeller on the back end of the cutter-bar.

The instrument is light, well balanced and easy to clean. It comes to the profession for what it may be worth, unpatented and without royalty, so it is to be had at the lowest figure that good material and workmanship will permit.



Tonsil instrument in open position.

I trust that no member of the profession or any manufacturer will do me the discourtesy of having it patented or begin its manufacture without first consulting me.

Acknowledging with gratitude my indebtedness to all those that have labored in this line before me, I affectionately give this instrument to the profession.

NEW TONSIL INSTRUMENT

HENRY M. GOODYEAR, M.D., CINCINNATI

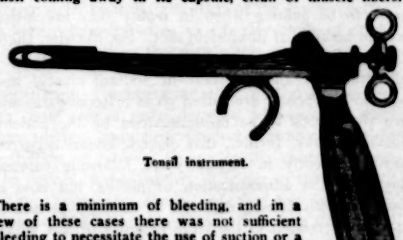
The accompanying illustration of this instrument is sufficient to explain the general mechanical construction. As to application, the instrument is applied to the tonsil after the fashion of any tonsil enucleator built on the plan of a permanent ring fenestrum.

The handle is so placed that the force is applied at right angles to the point of application to the tonsil.

After engaging the tonsil through the fenestrum, the finger piece is raised, locking automatically, and the final enucleation is completed by slowly turning the ringed screw at the top.

The dull ring separates the tonsil from behind forward, following the line of extracapsular clearage, and bluntly dissecting the tonsil from its bed.

More than a hundred operations have been performed with the latest model of this instrument, and it has been found practically impossible to injure the tonsil pillars or the superior pharyngeal constrictor muscle back of the tonsil, the tonsil coming away in its capsule, clean of muscle fibers.



Tonsil instrument.

There is a minimum of bleeding, and in a few of these cases there was not sufficient bleeding to necessitate the use of suction or a sponge.

I finished the first model of this instrument in 1917, and after having revised it many times in getting the proper proportions and principle, and having faithfully tried it in the field of operation, I believe I can conscientiously recommend it as an instrument simple and durable in construction, which gives the minimum of bleeding and trauma, with a complete and simple enucleation of the tonsil. It is especially well adapted to general tonsillectomies in children.

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THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

535 NORTH DEARBORN STREET - - - CHICAGO, ILL.

Cable Address - - - - "Medic, Chicago"

Subscription price - - - - - - Six dollars per annum in advance

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SATURDAY, JULY 16, 1921

EDEMA IN DIABETES

Edema is commonly associated with cardiac or renal disturbances; hence the expressions cardiac or nephritic edemas have found considerable vogue in medical literature. The edema of heart disease depends in large measure on stasis of blood in the systemic veins; but this is by no means always the sole factor concerned. Doubtless, local circulatory changes and chemical peculiarities of certain tissues may be contributory in the genesis of cardiac edema. All of these occasionally come into play in the case of pulmonary edema. Nephritic edema is frequently treated as a condition in which water is retained in the body owing to inability of the kidneys properly to eliminate salts, notably sodium chlorid. There is no longer any doubt, however, that the water retention may in some instances be the primary disturbance, the retention of salt being secondary and necessary to maintain a more normal composition of the body fluids.

Edema has long been known in diabetes as a complication which may become extreme. When it results in a noteworthy gain in weight, it may become a source of error. As has been pointed out by Joslin,[1] patients may seem to be gaining when in reality they are losing weight because of insufficient diet. So, likewise, slight changes in body weight which may accompany dietetic alterations or the ingestion of sodium chlorid and sodium bicarbonate are looked on as material gains and are thus liable to be misunderstood by the patient. Joslin remarks, further, that diabetic edema occurred most frequently in former years following oatmeal days and the administration of alkalis, but now is common with fasting diabetics of severe type and is apparently related to the large quantity of salt which they ingest with broths and vegetables.

This is by no means, however, the sole cause or the whole story of diabetic edema. Wilder and Beeler[2] have lately reminded us that the symptom may arise in cachectic patients without signs of albuminuria or other evidence of disease of either heart or kidneys. Oliguria need not accompany the formation of the edema, this depending more on increased intake of water than on the suppression of urine. Likewise, no very marked suppression of salt excretion is evident; a large daily excretion of sodium chlorid accompanies the maximal edema. The feeding of sodium chlorid, as has long been known, favors the formation of the edema, but a rising edema occurs at times with a normal salt intake. Many of these phenomena are in striking contrast to conditions existing in cardiac or nephritic edemas.

Evidently, undernutrition plays peculiar havoc with the water balance of the organism. It appears that severe inanition may be attended with a lowered renal threshold for chlorids when nephritis is not a complicating factor. Why should edema thereupon arise? According to the investigations at the Mayo Clinic, both the edema and the behavior of the chlorid threshold are independent of the state of the acid-base equilibrium of the body, as measured either by the carbon dioxid capacity of the plasma or by the titratable acid or ammonia excretion of the urine. Increasing edema and lowering chlorid threshold may accompany diminishing acidosis, and vice versa. They are likewise independent of the degree of glycemia and of the presence or absence of glycosuria. Hence, Wilder and Beeler conclude that edema in diabetes differs fundamentally from the edemas in diseases of the heart and kidneys. The determining factor seems to be inanition, which relates it to the hunger edema of war times and other edematous conditions of undernutrition.

1. Joslin, E. P.: Treatment of Diabetes Mellitus, Philadelphia, Lea and Febiger, 1917, p. 124.
2. Wilder, R. M., and Beeler, C.: Plasma Chlorids and Edema in Diabetes, Am. J. Physiol. 55: 287 (March) 1921.

CRITIQUE OF GASTRIC ANALYSIS

Those who read the literature of gastro-enterology must be impressed by the apparent conflict of opinions that prevails with respect to many fundamental factors in this department of medicine. The situation has become so complicated that many practitioners have frankly confessed their inability to derive as much dependable information from modern gastric analysis as the importance and the long maintained prominence of the subject would seem to warrant. Somehow it appears to many as if more real therapeutic helpfulness was forthcoming in the earlier days of simple estimations of "free" and "total" acidity developed by the Ewald test breakfast or the Riegel test dinner than is now furnished by the almost innumerable procedures of gastric examination, including roentgen-ray observations which will soon be able to claim a history of a quarter-century.

An explanation of some of the causes of the existing confusion and corresponding lack of confidence in the diagnostic claims of the gastric clinic has recently been ventured in THE JOURNAL by Rehfuss and Hawk.[1] They point to the frequent inability to discriminate

1. Rehfuss, M. E., and Hawk, P. B.: Gastric Analysis, I, Fundamental Principles, J. A. M. A. 76: 371 (Feb. 5) 1921.

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between the limitation of the roentgen-ray examination and that of gastric analysis. The latter, according to their interpretation, is simply a measure of gastric work involving three important factors: (*a*) gastric motor function, as shown by the duration of digestion manifested after the administration of a certain test meal; (*b*) secretory function, which is the sum total of all the factors, extragastric and intragastric, making up the secretory curve, and finally (*c*) the determination of evidence of a pathologic condition of the stomach, such as mucus, pus, blood, bacteria, organic acids or protein, which in themselves are either contributed by the lesion, or are occasioned by it.

If gastric analysis is at present designed to measure the sum total of gastric work, it must be obvious that the results at any period may vary with the task imposed upon the digestive organ. Doubtless, investigators will differ widely in their judgment as to what type of test meal will best elicit desired information. It would seem, however, as if today the assumed advantages of one or the other meal were overshadowed by the extreme variety of procedures, resulting almost in complete chaos in the mind of the untutored practitioner. We heartily agree with the Philadelphia gastro-enterologists that "one of the greatest drawbacks in gastric analysis is the lack of standardization." There is no ideal test meal. The requirements have been tersely stated by Rehfuss and Hawk: The meal must be accessible, of an average short evacuation time, and must not interfere with the detection of pathologic products. They favor the Ewald meal, owing to its simplicity, accessibility, stimulating power, and particularly our accumulated knowledge of its value in both normal and pathologic conditions of the stomach. At present, complexity of test meals merely spells confusion.

Another innovation in diagnostic procedure for gastric examination is represented by the "fractional method" of withdrawing contents for analysis. Small portions, not exceeding 10 c.c. (one-third ounce), are aspirated at intervals of fifteen minutes with the avowed object of following more carefully the successive phases of the digestive phenomena. This practice, already widely employed, is presumably based on the assumption that the gastric chyme, after a test meal, is a homogeneous mixture so that a sample withdrawn in the current manner represents the acid concentration of the gastric contents as a whole at any given period of digestion. The investigations of Gorham[2] indicate that the assumption may become untenable, particularly in conditions of disease. The "sample" obtained by the "fractional method" only represents the acidity of the gastric chyme at that moment in the part of the stomach from which it is obtained; or, in other words, it is dependent entirely on the position of the tip of the tube in the stomach. As Gorham shows, this position is necessarily a constantly changing one, owing, first, to the change of size and position of the stomach while emptying itself through the pylorus and by aspiration; secondly, to the shortening and lengthening of the stomach from gastric contraction; and, thirdly, to the peristaltic waves that tend to carry the tube toward the pylorus. Hence Gorham insists that in order to speak of a quantitative gastric analysis, the stomach must be emptied completely at a definite time after a standard test meal. This will be recognized at once as a return, in principle, to the old fashioned procedure of two decades ago.

2. Gorham, F. D.: Variations of Acid Concentration in Different Portions of the Gastric Chyme, and Its Relation to Clinical Methods of Gastric Analysis, Arch. Int. Med. 27: 434 (April) 1921.

ANTIRABIC INOCULATION FOR DOGS

Rabies is a disease that occurs virtually all over the world, and man invariably contracts it from some lower animal, usually the dog. In view of the seriousness of the malady, preventive measures have long attracted the attention of hygienists. The prophylactic treatment due to the epoch making investigations of Pasteur has attained a permanent place in medical practice. Stimson[1] of the U. S. Public Health Service recently assured the readers of THE JOURNAL that rabies vaccine, prepared by various procedures, is now available throughout all portions of the United States to the extent that it may fairly be said that no exposed person need die of rabies for lack of injections. Many health boards are prepared to furnish it free of cost to the indigent, and the cost of the commercial preparations is not prohibitive except to the destitute, for whom other provisions are made in almost every instance.

Individual prophylactic treatment, of course, cannot in any sense be regarded as a satisfactory scheme for the prevention of rabies in a community. The problem of the carrier of the materies morbi, the dog, is of greater moment. Accordingly, in recent years the plan of destroying ownerless dogs, and of muzzling and keeping under restraint all others of the canine species, has been demonstrated as an effective mode of eradicating rabies where the restrictions are carried out rigorously. The experience of England is often cited in illustration. Consistent muzzling of all dogs, together with most radical restrictions on admission of dogs from foreign countries, produced almost complete elimination of rabies. Owing to the enormous area to be policed in this country, it is not so easy to carry out the systematic control of the dog population. Whenever rabies becomes more prevalent than usual in any state, however, restrictive measures are likely to be put into operation until a period of comparative safety leads to renewed indifference.

According to recent advices from Japan, rabies, which formerly occurred there in only a few instances and within narrow limits, is beginning to become more prominent, cases appearing in all parts of the country.

1. Stimson, A. M.: Biologic Therapy, XII, Rabies Vaccine, J. A. M. A. 76: 241 (Jan. 22) 1921.

The method of prevention heretofore applied by killing rabid and stray dogs, and by confinement or muzzling of pet and licensed animals, has proved insufficient to eradicate rabies in Japan. Umeno [2] and his co-workers at the Kitasato Institute for Infectious Diseases in Tokyo, believing that something more than dog control is required to combat the disease, have investigated the possibility of prophylactic inoculation which might be applied extensively to the canine population. The procedure applied to man and involving many repeated injections of vaccines of varying potency or attenuation would obviously be impracticable in the treatment of large numbers of dogs. However, the Japanese bacteriologists assert that they have succeeded in perfecting a method whereby a successful prophylactic inoculation may be made in one or two injections. It has been tested on hundreds of dogs. For example, during the year 1919, there were 14,644 registered pet dogs in Kanagawa Prefecture, of which 9,150 were vaccinated. Among that large number of vaccinated dogs, there occurred no cases of rabies. None suffered from infection after vaccination. Umeno and his co-workers, who can now report on results involving more than 31,000 vaccinated dogs, assert that there has been a striking decrease of rabies, rabid dogs appearing only among the nonvaccinated. Hence they advocate the prophylactic inoculatoin of licensed dogs in addition to the other measures now taken to remove the danger of rabies from the human population. Like many hygienic proposals, this one concerns the welfare both of man and of the domestic animals.

CIRCULATORY REACTIONS TO HEMORRHAGE

Hemorrhage represents one of the emergencies that occasionally present a serious situation to the functioning organism. If loss of blood invariably brought about a lowering of arterial tension because of the depletion of the circulating fluid, the conditions ensuing might frequently be most unfortunate. Lowered blood pressure is liable to lead to less efficient supply of blood to important bodily structures, with a consequent impairment of function owing to lack of adequate oxygen and tissue nutrients. Low pressure may become synonymous with poor circulation.

Numerous investigations have demonstrated, however, that unless the hemorrhage is extensive, this expected sequence of events does not occur. Even after considerable hemorrhages, the fall in blood pressure rarely is as marked as might be anticipated. What happens to counteract the inevitable tendency toward a depletion of the circulatory system? The pulse rate increases so that the return of venous blood to the heart is augmented. More rapid breathing also facilitates the return flow from the abdomen. It has long been known that fluid enters the blood from the tissues with extraordinary rapidity so as to replace some of the loss by hemorrhage. It has been stated that this dilution of the blood occurs so rapidly that blood coming from an open artery becomes perceptibly lighter in color at the end of a few minutes of moderate bleeding.[1] This is the reason it becomes so important therapeutically after hemorrhage to place at the disposal of the body sufficient liquid to enable the tissues to restore their temporary losses.

Meek and Eyster [2] have lately demonstrated in experiments on animals that the volume output of the heart is rarely diminished after bleeding, except for a slight drop during hemorrhage, until the loss of blood amounts to about 2 per cent. of the body weight. By the use of roentgenograms taken of the heart before and after hemorrhage, it was shown that the diastolic size is maintained even after the loss of large quantities of blood. In twenty-one experiments, each with from two to six hemorrhages, the heart did not decrease more than 5 per cent. until the loss of blood on an average equaled 2 per cent. of the body weight. Ultimately, of course, the compensation breaks down with continued bleeding. The steady decrease in blood volume is sharply contrasted with the sudden reduction in diastolic heart size which occurs when about 20 per cent. of the blood is lost, and which would seem to indicate the breakdown of some protective mechanism, according to Meek and Eyster. A unique advantage seems to lie in the retention of diastolic size of the heart; for modern researches have shown that, as in the case of skeletal muscle, the efficiency of cardiac contraction depends on the length of the muscle fibers.

Will increased heart rate or dilution of the blood or both suffice to account for this beneficent protection against loss of cardiac efficiency after ordinary hemorrhage? Meek and Eyster think not. They urge that accelerated pulse occurs only after considerable blood has been lost; and they maintain that the known observations will not justify attributing to the absorption of tissue fluid more than a secondary part in the maintenance of the cardiac diastolic size after hemorrhage. Meek and Eyster find that the only satisfactory explanation is the conclusion that the effective circulation is kept up by constriction of the venules and capillaries, particularly those which have been more or less stagnant. When hemorrhage in the intact animal reaches about 2 per cent. of the body weight, the venules and capillaries of the ear may be seen markedly to constrict. Since such a mechanism is thus shown by Meek and Eyster to exist, it becomes probable, as they say, that the compensatory reaction may have been operating in various parts of the body in earlier stages of the hemorrhage, and that in this way there is provided a constant venous return and cardiac output, even though the blood volume is decreased.

2. Umeno, S., Vet and Doi, Y.: A Study on the Anti-Rabic Inoculation of Dogs and the Results of Its Practical Application, Kitasato Arch. Exper. Med. 4: 89 (March) 1921.

1. Hewlett, A. W.: Pathological Physiology of Internal Diseases, New York, D. Appleton & Co., 1916, p. 586.
2. Meek, W. J., and Eyster, J. A. E.: Reactions to Hemorrhage, Am. J. Physiol. 56: 1 (May 1) 1921.

Current Comment

METABOLISM IN INFANTILE ATROPHY

The intelligent management of the type of "infantile atrophy" in which there is inadequate growth at early ages demands information that has only recently become available. It is conceivable that the failure of infants in this condition to grow properly may be due to some defect of metabolism resulting in an inability to utilize properly the available sources of energy. Equally possible is the existence of alimentary conditions which render the digestion and absorption of food products faulty. With respect to the fate of ingested proteins or fats in atrophic infants, the available evidence lends no support to the assumption that there is any lack of alimentary availability of these nutrients.[1] The data which Fleming[2] has secured in a study of the respiratory exchange of cases of infantile atrophy at the Royal Hospital for Sick Children in Glasgow give testimony against any assumption that the tissues of such individuals are unable to utilize either fats or carbohydrates. There is no extravagance in their metabolism, and the evidence indicates that in atrophy the essential constituents of the diet can be normally utilized when once they actually gain access to the metabolizing tissues. By exclusion, some failure of alimentation must be held responsible for the state of malnutrition under discussion. Fleming's inquiries place the probable blame on gastro-intestinal disturbances leading to defective absorption, especially of carbohydrates. If this shall indeed prove to be an important factor in the production of atrophy, dietotherapeutic procedures are within the range of immediate consideration.

WHAT IS AN ANTIBODY?

Within the last few years the words "antigen" and "antibody" have become terms in the vocabulary of practical medicine as well as in the science of immunology. Discussion of the general phenomena of immunity can scarcely be carried on without reference to them. An antigen is a substance which, on introduction into the body in proper amounts and under suitable conditions, induces the formation of a special antagonistic substance, the antibody. At the present moment there are scarcely any well authenticated exceptions to the general rule that every soluble complete protein may serve in at least some degree as an antigen. With respect to the cleavage products of the proteins the evidence of their antigenic properties is at most debatable; certainly none of the amino-acids or simpler polypeptids, i. e., amino-acid complexes, can serve as antigens. The alleged function of lipoids in this rôle is likewise not established. Karsner and Ecker[3] insist, in fact, that if lipoids are obtained from animal tissues, favorable results may be obtained; but in none of these experiments is it proved that the lipoids are entirely free from proteins. Far less is definitely known with respect to the nature of the manifold antibodies. Diphtheria antitoxin, which has been studied longest in an intensive manner, has served as the prototype of this class of substances. There has been much evidence to indicate its close relationship or association with certain proteins, notably the globulins of the blood. It is not analogous to enzymes, if one may judge from the failure of antitoxin to be adsorbed by or removed from solution with a variety of indifferent precipitates. The large size or colloid character of the antibody molecule is shown by its comparative non-diffusibility. Recent studies by Huntoon, Masucci and Hannum[4] have helped to narrow the field of investigation somewhat by indicating more clearly than heretofore that antibodies do not belong to that group of proteins usually classed as serum proteins. They showed, as others have previously indicated, that antibodies resist tryptic digestion—a fact which makes them unlike ordinary proteins. Antibodies, furthermore, do not manifest those biochemical reactions and transformations which are at present ascribed to the ill-defined euglobulin and pseudoglobulin fractions of the blood. Being insoluble in ether, they cannot be classed as lipoids or fats. By knowing more precisely what antibodies are not, we may hope to succeed better in the coming years in learning more adequately what they really are.

A PLEA FOR MEDICAL PROTOZOOLOGY

The occurrence of intestinal protozoa in man has long since ceased to be of concern to the student of tropical medicine alone. Such organisms as the nonpathogenic parasite *Endameba coli* and the pathogenic *Endameba histolytica*, for example, now appear to have an unexpectedly widespread distribution among persons in temperate as well as in torrid climates. The problems of the rôle of the protozoa of man, in health and disease, involving questions of identity of the parasites, their pathogenicity, the carrier state, the modes of transmission, the possibility of intermediate hosts, the therapy of the disturbances created, etc., have become so varied that they call for serious and extensive investigations in the interests of medicine. It almost seems as if a faculty of experts were required to attack the numerous aspects of the new medical protozoology. The need of more surveys of the occurrence of intestinal protozoa, in order to add to the present medical knowledge of the incidence of each species according to geographic range, age, race and occupation has been emphasized by Hegner and Payne.[5] They urge physicians to direct more attention to the prevalence of intestinal protozoan parasites, thereby stimulating clinical work on pathogenesis and therapy. If mankind is frequently harboring unsuspected invaders which produce local damage or elaborate chemical products that act as subtle poisons to the system, they need to be discovered. For years the urine was the center of interest in certain features of clinical diagnosis; then the blood began to gain a prominence

1. Finkelstein, H.: Jahrb. f. Kinderh. **68**: No. 5. Rubner, M., and Heubner, H.: Ztschr. f. Biol. **38**: 315, 1899. Hutchison, R. S.: Quart. J. Med. **13**: 277 (April) 1920.
2. Fleming, G. B.: An Investigation into the Metabolism in Infantile Atrophy, with Special Reference to the Respiratory Exchange, Quart. J. Med. **14**: 171 (Jan.) 1921.
3. Karsner, H. T., and Ecker, E. E.: The Principles of Immunology Philadelphia, J. B. Lippincott Company, 1921, p. 22.
4. Huntoon, F. M.; Masucci, P., and Hannum, E.: Antibody Studies, III, Chemical Nature of Antibody, J. Immunol. **6**: 185 (March) 1921.
5. Hegner, R. W., and Payne, G. C.: Surveys of the Intestinal Protozoa of Man in Health and Disease, Scient. Month. **12**: 47 (Jan.) 1921.

formerly unachieved; now it is the feces that deserve to claim a share of attention in the careful diagnostic scrutiny of man. Bacilli, spirochetes, blood plasmodia, intestinal protozoa, occasional fungi and yeasts—a motley army of enemies which we must learn to recognize and deal with sooner or later. Why not soon?

ETIOLOGY OF THE COMMON COLD

Any one who first studies the numerous elaborate discussions and directions on the prophylaxis and treatment of those acute conditions known as the common cold in the upper respiratory tract will be profoundly disappointed at learning how little is definitely known about the etiology of the condition. There is a widespread belief—or an assumption based on analogy with related diseases—that bacteria play a part in most colds. If one asks, however, for evidence regarding the microorganisms actually involved in the primary cold, an answer will rarely be forthcoming. One of the vague hypotheses requisitioned from time to time assumes that various types of bacteria are commonly harbored in the nasopharynx, and that only when the local resistance or the general immunity of the body is lowered by some unusual circumstance do they find opportunity to develop in harmful ways so as to produce coryza. The primary disease manifested by hyperemic phenomena in the upper air passages should be clearly differentiated from local complications, chiefly due to pyogenic organisms, which frequently accompany a common cold. They include sinus infections, middle ear infections, laryngitis, tracheitis and bronchitis—rarely pneumonia and sepsis. Bloomfield [1] of the Johns Hopkins Hospital has lately come to the conclusion that none of the common bacteria found in the nose or throat have been proved to be the primary cause of colds. In uncomplicated cases the flora differs in no fundamental way from that found in healthy persons, although it is distinctly richer and more varied. This, Bloomfield reminds us, fits in with the old theory that the cold, whether produced primarily by temperature changes or by infection, leads to environmental alterations which, as it were, light up the bacterial flora already present in the pharynx. Yet the presence of these organisms is too variable and inconstant to warrant the conclusion that they are the primary causes of colds. Bloomfield finds the most convincing evidence in the scanty literature to favor a filtrable virus as the cause of the common colds. This tentative conclusion recalls the pioneer statement of Kruse,[2] who instilled Berkefeld filtrates of dilutions of nasal secretion from patients with acute colds in the nasal passages of healthy persons, thereby developing typical colds in many of them. Foster [3] has reported similar results in this country. Correct treatment demands an exact knowledge of etiology. Prophylactic inoculation with mixed vaccines has proved to be illusory. Perhaps a reinvestigation of the theory of a filtrable virus will not be devoid of profitable outcome.

1. Bloomfield, A. L.: Variations in the Bacterial Flora of the Upper Air Passages During the Course of Common Colds, Bull. Johns Hopkins Hosp. 32: 12 (April) 1921.
2. Kruse, W.: Die Erreger von Husten und Schnupfen, München. med. Wchnschr. 61: 1547, 1914.
3. Foster, G. B., Jr.: The Etiology of Common Colds, J. A. M. A. 67: 1180 (April 15) 1916; J. Infect. Dis. 21: 451 (Nov.) 1917.

Association News

REPORT OF SPECIAL COMMITTEE ON DEPARTMENT OF PUBLIC WELFARE

At the Boston session the President of the Association was authorized to appoint a committee to confer with the President of the United States on matters pertaining to public health (The Journal, June 18, p. 1762). The committee has submitted the following report to the President of the Association:

Washington, D. C.
July 6, 1921.

Dr. Hubert Work, President,
American Medical Association:

We, the members of the special committee appointed by you, make this preliminary report.

The committee has held three meetings in Washington. As a result of these conferences, we believe that the administration and members of the Congress, who are responsible for the organization of the contemplated Department of Public Welfare do not have in mind the establishment of a federal medical paternalism, or do not intend in any way to interfere with the practice of medicine and surgery as now carried on by legally licensed practitioners.

We believe that the main and important object of the impending federal legislation is to secure coordination of all existing federal bureaus and agencies relating to the welfare of the public in one department of the government; to standardize public health and other welfare work of the government; to secure cooperation with the respective state governments in all matters relative to public health and welfare.

The committee will maintain its active consideration of these measures and will attempt to secure the adoption of the foregoing principles in the finally completed legislation.

C. E. Sawyer, M.D. Charles W. Richardson, M.D.
G. D. de Schweinitz, M.D. Thomas S. Cullen, M.D.
Frank Billings, M.D.

Medical News

(Physicians will confer a favor by sending for this department items of news of more or less general interest: such as relate to society activities, new hospitals, education, public health, etc.)

CALIFORNIA

Personal.—Dr. William Edler, public health service, formerly director of the U. S. Interdepartmental Social Hygiene Board, Los Angeles, has been transferred to take charge of the government hospital in Tacoma, Wash., where mental cases are being treated.

Chiropractors Given Jail Sentence.—Refusing to stop the practice of chiropractic without a license, Alice Huhn of Anaheim was sentenced, May 27, to sixty days in the county jail.——It is reported that F. B. Whidden, publisher of the *California Chiropractor*, was sentenced, June 17, to sixty days in jail for practicing without a license.

COLORADO

Emergency Hospital at Pueblo.—At the request of the governor of Colorado, immediately after the recent flood at Pueblo, the authorities of the Fitzsimons General Hospital, near Denver, organized and established an emergency hospital to take care of the sick and injured, and connected it by wireless with Fitzsimons Hospital. The relief expedition included eleven officers, fifteen nurses and twenty-five enlisted men of the medical department, with Major Shelly U. Marietta, M. C., U. S. Army, in command.

DISTRICT OF COLUMBIA

Annual Meeting of Medical Women.—At the annual meeting and supper of the Institute Fraternity, held, June 23, at the home of Dr. Julia M. Green, Washington, Dr. Addisone Boyce, New York, spoke on the "Future of Women in Medicine." Dr. Mary Elizabeth Hanks, Chicago, was toastmistress.

ILLINOIS

Gift of Laboratory to Hospital.—The Rockford Hospital has received the gift of a completely equipped laboratory from Mrs. Walter A. Forbes, as a memorial to her parents, Mr. and Mrs. Seeley Perry of Rockford.

Personal.—Dr. George G. Taylor, Elkhart, chief of the division of social hygiene, has resigned. He will devote his entire time to work in connection with the U. S. Public Health Service with which organization he holds a commission as surgeon. Dr. Taylor will probably be assigned to duty in Illinois.

Medical Practice Act Annulled.—In a decision handed down by the April term of the Illinois Supreme Court the medical practice act that became operative July 1, 1917, was annulled. The court held that the law is unconstitutional and is, therefore, void for the reason that Section 5 of the statute (medical practice act) unlawfully and unjustly discriminates against one class of practitioners. From the attorney-general comes the opinion that the act of 1899 with its amendments now automatically becomes effective. It is understood that the attorney-general has advised against asking a rehearing of the cases, as the opinion was unanimous.

Venereal Disease Campaign to Continue.—Although federal aid for the fight against venereal disease in Illinois ceased on July 1, 1921, because Congress failed to appropriate the necessary funds, the campaign will continue with the same vigor and aggressiveness that has characterized the work during the last three years. The fifty-second general assembly set aside $200,000 for this important phase of public health service for the current biennium. The division of social hygiene will, therefore, be able to "carry on." Owing to the uncertainty of continued federal or state financial aid, the nineteen clinics now operating in Illinois slowed up somewhat in their activities during the last few months. An agent of the department is making the round of these clinics with the good news that the usual funds will be forthcoming from the state. The message has proved to be very stimulating.

KENTUCKY

Physician's License Revoked.—It is reported that at a meeting, held May 25, the state board of health revoked the license of Dr. Charles L. Cawein, Louisville, who is under indictment charged with murder in connection with the death of a patient following a criminal operation.

LOUISIANA

Personal.—Dr. Stephen W. Stafford, New Orleans, superintendent of the Charity Hospital since 1897, resigned on account of physical indisposition. Dr. William W. Leake, former assistant surgeon of the Illinois Central Railroad Hospital, has been appointed to succeed him.

MARYLAND

Infant Malady Increases.—Three cases of infantile paralysis have been reported to the Baltimore City Health Department during the past week. Previous to last week there had been but three cases since the first of the year—one in January, one in February, and one in June. Officials of the department are not alarmed over the reporting of three cases in one week, but are watching the situation closely.

Personal.—Dr. Robert P. Bay has been appointed acting chairman to the board of supervisors of city charities, to succeed Dr. J. Hall Pleasants, resigned.——Dr. Martin R. Casey of Weston, W. Va., has been appointed assistant to Dr. Charles J. Carey, superintendent of the Eastern Shore State Hospital at Cambridge. Prior to his appointment, Dr. Casey was assistant superintendent of the West Virginia State Hospital.——Dr. Alan M. Chesney of Baltimore, class of 1912, Johns Hopkins Medical School, has been appointed associate professor of medicine at the Johns Hopkins Medical School. This is the first of a number of appointments to be made by Dr. G. Canby Robinson, recently made head of the department of medicine. Dr. Chesney will succeed Dr. Alphonse R. Dochez and will have charge of the bacteriologic division of the medical clinic at the hospital.

MASSACHUSETTS

Personal.—Dr. Francis W. Peabody, Harvard Medical School, has been appointed chief of the Harvard Teaching Service in the Boston City Hospital. He will also become director of the Thorndyke Laboratory in the City Hospital. He has been selected to represent Harvard at the dedication of the new building of Peking Union Medical College, China, in September, and also at the medical conference which will be held at the same time.

Dr. Cabot Entertains Physicians at Cohasset.—The seventy-five physicians who remained at Boston after the annual session of the American Medical Association, to take the course of lectures at the Massachusetts General Hospital, on "Differential Diagnosis," given by Dr. Richard C. Cabot, Harvard Medical School, were entertained at the summer home of Dr. Cabot, June 27, at an al fresco luncheon, with tennis, music and water sports. Dr. Cabot was presented with a lamp as an expression of esteem by the visiting physicians.

Valuable Library Service Open to Physicians.—The Scientific Temperance Federation, Boston, has probably the largest library in America of scientific works and references dealing with alcohol. To its services all physicians have easy and welcome access. At the annual meeting of the federation, held June 23, the secretary reported the result of three investigations of special interest made last year:

1. Evidence from all sections of the country obtained from public health and law enforcement officials showed practically no increase in drug addicts traceable to prohibition of alcoholic liquors, the apparent increase noted in a few cases being due to enforcement of antinarcotic laws.

2. A symposium from well-known physicians on present day medical practice in the use of alcohol as a preventive of, or remedy for, influenza and pneumonia, showed that all the writers agreed that alcohol cannot be considered a preventive of these diseases; and while many recognized that medical practice differs as to its administration, a considerable number thought it of no value and said they did not use it in these diseases.

3. A study of New York City statistics derived from weekly and monthly health reports as to adult mortality from Bright's disease, liver cirrhosis and alcoholism, and of early infant mortality, comparing figures under prohibition with those of five to seven previous years: The average annual number of deaths in 1919 and 1920 from Bright's disease and nephritis decreased 17 per cent. from the average number in 1912-1918; and liver cirrhosis, 49 per cent. The total number of deaths from alcoholism decreased from 687 in 1916 to 98 in 1920; on the average in fourteen large cities it was 84 per cent. lower in 1920 than in 1916-1917. The average annual mortality of infants under 1 year decreased in 1919 and 1920, 15 per cent. from the average for four preceding years; for the same periods the average of deaths under one month decreased 13 per cent. When the last six months of the successive years were compared, as prohibition did not go into effect till July 1, 1919, and there was a measles epidemic in the first half of 1920, the decrease in average total number of deaths under one month fell off 17 per cent. from the average for the four preceding years. The average infant mortality rate per thousand for 1915-1918 was 93; for 1919 and 1920, it was 84.

MICHIGAN

Medical Meeting Held on Mine Rescue Car.—The Houghton County Medical Society held its June meeting on Mine Rescue Car No. 10 of the U. S. Bureau of Mines, at Houghton. Dr. Cleve E. Kindall, surgeon of the U. S. Bureau of Mines, spoke on "First-Aid Training and Its Application to the Mining Industry," and Dr. Nathan S. MacDonald, Sidney Mines, N. S., told "What the United States Is Doing for the Disabled Soldiers."

Prisoners' Tuberculosis Hospital Camp.—It was decided at the meeting of physicians on duty in Michigan penal institutions, held June 29, at Lansing, that the state should establish a prisoners' tuberculosis hospital camp for treatment of inmates. The state commissioner of health was delegated to take up with the state administration, ways and means of building the hospital. It is estimated that there are 100 or more state prisoners who are suffering from tuberculosis.

Improper Diet Handicaps Children.—The traveling clinic of the state department of health, which in recent months has held clinics in twenty-five counties in both the upper and lower peninsulas, and examined 5,211 children, reports that 65 per cent. were underweight. According to a statement of the state health commissioner, undernourishment is not due to lack of food in the homes, in the majority of cases, but rather to the fanciful appetites of the children acquired through lack of discipline exercised over their diets, and to misunderstanding on the part of the parents as to what constitutes a proper diet. In order that the child may develop properly and gain a normal resistance to disease, Dr. Olin urges parents to adopt a diet of milk, cereals, fresh vegetables and fruits for their children, and compel them to eat at regular hours.

MINNESOTA

Formation of Society for Medical Experiment.—Twenty-three members of the faculty of the department of agriculture and school of medicine, University of Minnesota, have recently organized a branch of the Society of Experimental Biology and Medicine.

Personal.—Dr. William J. Mayo has recently been elected an honorary member of the Medico-Chirurgical Society of Edinburgh. The honorary membership of this society is limited to ten.——Dr. Harold E. Robertson, formerly director of pathology and bacteriology in the Medical School of the University of Minnesota, has been transferred to the staff of the Mayo Foundation of the university as professor of pathology. Dr. Robertson has also become a member of the staff of the Mayo Clinic as head of the section on pathologic anatomy.

Association of Resident and Ex-Resident Physicians of the Mayo Clinic.—The third annual meeting of the association, which was organized before the war, was recently held at Rochester. It was decided to publish the proceedings of the meetings in the form of transactions, and the first volume has recently appeared. Meetings will be held annually in Rochester, the date of the next being June, 1922. The following officers have been elected for the coming year: president, Dr. Donald G. Guthrie, Sayre, Pa.; vice president, Dr. George M. Thomas, Minneapolis; secretary, Dr. Harold L. Foss, Danville, Pa.; assistant secretary, Dr. Archibald H. Logan, Rochester, and treasurer, Dr. Arthur H. Sanford, Rochester.

MISSOURI

Municipal Hospital Farm.—The board of aldermen, St. Louis, passed a bill, June 24, appropriating $175,000 for the purchase of a large tract of land as the site for the proposed Municipal Hospital Farm. A bond issue of $1,100,000 has been authorized by the voters to establish the farm. When completed, the new institution will materially reduce the congestion in the city sanatorium and other hospitals maintained by the city.

State University News.—The board of curators of the state university has taken a definite stand in favor of establishing a four year course in medicine at the university. The board will prepare a bill for presentation at the next session of the legislature in 1923 to authorize and appropriate money for the establishment of a state hospital at Columbia to be operated in conjunction with the medical school. The Missouri State Medical Association at its last annual meeting at St. Joseph appointed a special committee to cooperate with the university in drafting a bill for the creation of the state hospital and the establishment of a four-year medical course. The members of this committee are: Drs. R. M. Funkhouser, St. Louis, chairman; W. H. Brewer, St. James; F. G. Nifong, Columbia.

Meeting of Health Officers.—The second annual meeting of the Missouri Health Officers Association was held at Columbia, June 20. Some of the subjects discussed were: "American Red Cross Cooperation," by Dr. George H. Jones; "The Venereal Progress to Date," by Dr. R. L. Russell; "Physical Defects and Communicable Diseases Among Children," by Dr. C. P. Knight; "The State General Hospitals," by Dr. F. G. Nifong; "School of Medicine and Hospitals," by Dr. Guy L. Noyes. Other phases of public health work were discussed, particularly rural hygiene by Dr. Cortez F. Enloe, state health commissioner. The luncheon at Boone Tavern given by the state university proved an enjoyable hour for informal talks. Forty-eight members of the conference were present.

New Nurses' Law Effective.—The new nurses' law passed at the last session of the legislature became operative, June 20. It requires every person nursing for hire to obtain a license from the Nurse Examining Board and creates a new division of nursing called licensed attendants. The preliminary educational requirements for registered nurses will be four years in a high school after July 1, 1928, but licensed attendants need have only an eighth grade certificate. Annual reregistration is required so that the nursing resources of the state will be a matter of official record at all times. Nurses who are now practicing and registered must reregister with the board before Jan. 1, 1922, or take another examination. In communities of 30,000 or less a nurse may practice for hire as a "licensed attendant" without specified educational qualification, on the certificate of a licensed physician. Such attendants cannot practice outside of their communities.

Personal.—Dr. Cortez F. Enloe has been appointed state health commissioner by the state board of health. Dr. Enloe is also secretary of the board.——Dr. Thomas Parran, Joplin, has been appointed to take charge of the work of the Bureau of Rural Sanitation. Both of these offices were created by the last legislature.——Dr. and Mrs. Ralph L. Thompson, St. Louis, will spend the summer in Europe visiting London and Paris. They sailed on the *Aquitania*, July 5.——Dr. A. L. Furth, Cape Girardeau, chief of the resident staff of St. Louis City Hospital, completed his six-year course at the City Hospital, July 1, and has been succeeded by Dr. Howard C. Brascher as chief of the resident staff. Thirty-six new interns became members of the staff, July 1, thirty juniors and five seniors having completed the one and two year courses.——Dr. G. A. Jordan, assistant health commissioner of St. Louis, has been appointed hospital commissioner, to take effect July 15, to succeed Dr. C. H. Shutt, resigned. Dr. Jordan has been connected with the health department of St. Louis for thirty-four years, being assistant health commissioner for the past thirteen years.

State Board of Control.—Governor Hyde has appointed a new nonpartisan board of control consisting of six members, three Republicans and three Democrats, to manage the eleemosynary institutions under a new law passed by the last general assembly. It is expected that this readjustment of the management of the institutions will prevent political influence from affecting the appointment of superintendents and employees and make the tenure of medical officers depend on professional ability and adaptability to the work. The new board displaces six dependent boards of five members each. The institutions affected are: State Hospital No. 1 at Fulton, State Hospital No. 2 at St. Joseph, State Hospital No. 3 at Nevada, State Hospital No. 4 at Farmington, the State Sanatorium for Incipient Tuberculosis at Mount Vernon, and the Colony for the Feeble-Minded at Marshall. The following were appointed on the board: H. D. Evans of Bonne Terre, a banker and member of the Republican State Committee; W. C. Pierce of Maryville, banker, a member of the board of managers of State Hospital No. 2, Charles Rendlin of Hannibal, Republicans; Frank Farlow of Webb City, formerly chairman of the Jasper County Democratic Committee; R. M. White of Mexico, newspaper publisher and member of the board of managers of State Hospital No. 1, and Arthur Fitzsimmons, a St. Louis lawyer, Democrats. Evans' and Farlow's terms expire June 19, 1924; Pierce's and White's terms expire June 19, 1923, and Rendlin's and Fitzsimmons' terms expire June 19, 1922.

MONTANA

State Health Meeting.—The third annual meeting of the Montana Public Health Association was held in Billings, July 11-12. The principal address was delivered by Dr. Leslie L. Lumsden, Assistant Surgeon-General of the U. S. Public Health Service. Following the public health meeting the Montana Medical Association held its annual convention, July 13-14, giving physicians of the state an opportunity to attend both sessions.

NEVADA

State Medical Meeting.—The Nevada State Medical Association held its annual meeting, June 23-24, at Elko, under the presidency of Dr. Ralph A. Bowdle, East Ely. The following officers were elected for the ensuing year: president, Dr. R. A. Bowdle (reelected); vice presidents, Drs. Maritt J. Rand, Elko; John L. Robinson, Reno; secretary-treasurer, Dr. Sidney K. Morrison, Reno.

NEW YORK

Honors Graduates Who Served in War.—A bronze tablet, in honor of 185 graduates of the institution who served in the World War, was dedicated during the recent commencement exercises at Syracuse University College of Medicine.

Summer Course in Occupational Therapy.—A summer course in curative occupations will be conducted at Byrdcliffe, Woodstock, Ulster County, from July 6 to August 12, by the New York Society of Occupational Therapy. The class will be limited to 128 students.

Violation of Narcotic Law.—It is reported that Dr. John C. Russell, Saranac Lake, president of the village, and also president of the board of education, has pleaded guilty to violation of the Harrison Narcotic Law, and was sentenced to pay a fine of $100, or $20 on each count.

Wins Damage Suit for Diabetes.—A jury before Supreme Court Justice O'Malley upheld the claim of Mrs. Rose Cohen that as the result of a collision between a truck of the Bacon Coal Company and a Gates Avenue car in Brooklyn, in 1919, she was injured in such a manner that diabetes developed and she became an invalid and lost 70 pounds. The jury gave a verdict of $12,000 against the coal company. During the proceedings Sir William Osler was quoted to prove that diabetes could be caused by shock.

Personal.—Dr. Pliny B. Fiske, Byron, sustained injuries about the body, and possibly internal injuries, when his automobile ran into a ditch, when attempting to pass an auto truck, causing Dr. Fiske to be thrown out of the car.——Col. Homer Folks has been reappointed by Governor Miller to succeed himself as member of the Public Health Council for the term of office, which is six years.——Surg. Samuel B. Grubb of the U. S. Public Health Service has been detailed as chief quarantine officer of the port of New York, succeeding Surg. Leland B. Cofer, who has been relieved on account of ill health.

Plattsburg Camp Plans Health Follow-Up.—According to an announcement by Capt. Arthur F. Cosby, executive secretary, the Military Training Camps Association, a new health examination plan will be inaugurated at the Plattsburg camps this summer, providing for a complete physical examination of each man on arrival at the camp, with notations of his physical defects. On his return home he will receive a report of his physical condition and will be advised what course of treatment to follow to eliminate any disabilities. It is believed that by means of a follow-up system after the men return from camp permanent results will be accomplished in improving the health of the men.

New York City

Personal.—Dr. Thomas W. Salmon has been appointed professor of psychiatry at the Columbia University College of Physicians and Surgeons, and has resigned from the staff of the Rockefeller Foundation. Dr. Salmon will continue to serve as medical director of the National Committee for Mental Hygiene.

NORTH CAROLINA

Library Given to University.—The medical library of fifty-two volumes belonging to Capt. John Edwin Ray, Jr., who was wounded in the battle of Bellicourt, and died in October, 1918, has been given by his mother to the library of the University of North Carolina.

Change of Rules Relating to Election of Officers.—The North Carolina Medical Society has adopted resolutions for the naming of new officers by the entire society, instead of by the nominating committee as heretofore. According to the custom of the society, changes in the by-laws must wait one year before final action is taken.

OHIO

Use of Reformatory Boys for Nursing.—The state legislature has appropriated $25,000 for the construction at the Sandusky Soldier's Home of a model home for Mansfield Reformatory boys who are used as nurses at the Sandusky Hospital. Ohio is said to be the only state where prisoners are used as nurses.

Personal.—Dr. Harry H. Snively, Columbus, has been appointed by the governor as director of the department of health. Under the reorganization plan which went into effect, July 1, the department of health took over from the secretary of state the functions of the state inspector of plumbing and the state registrar of vital statistics.

OREGON

Memorial to Dr. Yenny.—At a recent meeting of the board of regents of the University of Oregon, it was decided to place contracts immediately for the construction of the new medical school building in Portland. It was also decided to name the medical school building after the late Dr. Robert C. Yenny.

PENNSYLVANIA

Chiropractor Fined.—A news item states that, June 13, W. H. Gittings, chiropractor of Bethlehem, was found guilty of practicing medicine without a license and fined $1 and costs.

Doctors Lose Licenses.—It is reported that at a meeting early in June the Bureau of Medical Education and Licensure revoked the licenses of Drs. W. H. Theal and John G. Dougherty of Philadelphia, and Frank L. Seely of Jersey Shore, following investigations of charges of violation of regulations of the medical practice law.

Personal.—Dr. Hobart Amory Hare, professor of materia medica in Jefferson Medical College, has received the degree of doctor of laws, University of Pennsylvania.——Dr. John A. Kolmer, professor of pathology and bacteriology in the graduate school of medicine of the University of Pennsylvania, and director of the pathologic laboratories of the Dermatological Research Institute, has received the degree of doctor of science from Villanova College.——Dr. Jessie R. Peterson has tendered her resignation as resident physician of the department for women of the State Hospital for the Insane, at Norristown.

Philadelphia

First Sane Fourth.—The city passed the first sane fourth in its history. There were no long lists of fireworks victims. There were no children lying dead, mute testimony to the possibilities of the "harmless" sparkler. No children were made armless because they did not know the cannon cracker was lighted. Only one injury was reported. A small boy was struck by a bullet from a revolver. The man who fired the revolver wound up in a cell. He did not know it was loaded and the casualty, anyhow, was not due to fireworks.

Health Board Asks for School Nurses.—An increased corps of school nurses will be urged on the board of education, according to the department of public health, of which Dr. C. Lincoln Furbush is director. At present 65,000 children in the elementary schools and 8,000 in the elementary continuation schools, Girls' Trade School, senior high schools and junior high schools are without the service of nurses. Furthermore, those who are now on duty are overtaxed, because of the large number of children assigned to their care.

SOUTH CAROLINA

Campaign of Health in Schools.—A commission has been appointed by Dr. Harry L. Shaw, Sumter, president of the South Carolina Medical Association, from the state association, to investigate the sanitary and hygienic conditions of the public schools and formulate plans for their improvement.

TEXAS

New Army Hospital at El Paso.—The William Beaumont General Hospital at El Paso with a 400-bed capacity was opened, June 15, with 230 patients and with a medical army personnel of twelve officers, twenty-seven nurses and 173 enlisted men.

WASHINGTON

State Examining Board.—Dr. Charles C. Tiffin, Seattle, has been appointed by the governor as one of the members of the state examining board, provided by the administrative code. Other members of the new board are: Dr. John B. McNerthney, Tacoma, and Dr. John W. Mowell, Olympia.

CANADA

Personal.—Dr. Roscoe Graham, Toronto, has been west delivering the address in surgery before the Saskatchewan Medical Association.——Dr. Clarence L. Starr, Toronto, surgeon in chief to the Hospital for Sick Children, has been appointed professor of surgery in the University of Toronto. ——Dr. John J. Fraser, formerly of Walkerton, Ont., at present practicing in Toronto, has been appointed district medical officer of health in the Fort William-Port Arthur district, succeeding Dr. Robert E. Wodehouse, who is now secretary of the Canadian Association for the Prevention of Tuberculosis.——Dr. Edward W. Montgomery, Winnipeg, has been elected president of the Canadian Medical Association, closing its fifty-second annual meeting at Halifax on July 9. Winnipeg is to be the place of meeting in 1922.——Dr. John Fenton Argue, Ottawa, has been elected president of the Ontario Medical Council.

GENERAL

Officers of Medical Women's Association.—At the annual meeting of the Medical Women's National Association, held recently in Boston, Dr. Mary Elizabeth Bass, New Orleans, was elected president, and Dr. Grace Kimball, Vassar College, Poughkeepsie, N. Y., president-elect. Madame Marie Curie was made an honorary member of the association.

Dinner in Honor of Rockefeller Foundation Representatives.—During a colonial health conference, the British government gave a dinner, June 13, at the Carleton Hotel, London, in honor of George E. Vincent, Wickliffe Rose, and Vincent G. Heiser, representatives of the Rockefeller Foundation. The Hon. Winston Churchill, secretary for the colonies, presided.

Personal.—Dr. Valeria Hopkins Parker, Hartford, Conn., has been appointed executive secretary of the United States Interdepartmental Social Hygiene Board, to succeed Dr. Thomas A. Storey, Washington, D. C., who, because of the

pressure of other duties, was not a candidate for reappointment. The board has charge of the moral protection of communities near the military and naval bases.

International Congress of Military Medicine and Surgery.—In response to an invitation extended to various allied powers requesting that delegates be sent from the armies and navies to join in the discussion of the lessons of the war in medicine and surgery, the United States government has forwarded orders to Commander Bainbridge to proceed to Belgium and attend the congress as the representative of the Medical Corps of the U. S. Navy. The date of the congress is July 15-20.

Amendment to Sheppard Bill Introduced.—An amendment to the Sheppard bill introduced by Senator Moses of New Hampshire would transfer the enforcement of this proposed act from the Children's Bureau of the Department of Labor to the U. S. Public Health Service of the Department of the Treasury. The contention of the senator is that the U. S. Public Health Service with its large and trained corps of physicians and surgeons would be better able to administer the measure than the Children's Bureau. The Sheppard bill is now before the Senate and is expected to be acted upon in the near future.

Senate Committee Reports Favorably New Dry Bill.—The Senate Committee on the Judiciary has favorably reported to the Senate the antibeer bill approved by the House of Representatives the later part of June. No changes were made in the provisions preventing a physician from prescribing beer as a medicine. Senator Sterling of South Dakota in filing the report declared that he expected to insist upon an early vote by the Senate. In a statement he said:

> The ruling of the former Attorney General allowing beer to be prescribed as medicine makes a farce of the prohibition law. It puts no limit on the amount and a doctor can prescribe it by the case or the keg. The bill as reported makes little change in the bill as approved by the House except for some slight modifications in the language dealing with the formulas for proprietary medicines and in the importation of certain wines needed for medicines.

Garden City Sanatorium.—Dr. André Baillon, laureate of the faculty of medicine, Paris, and president of the Franco-American Committee to Fight Tuberculosis, has come to America to complete the organization of the American membership of the committee and to form subcommittees in cities outside New York, with the object of completing the projected Garden City Sanatorium, in Provence, France. The sanatorium will be designed to take care of French soldiers who became tuberculous as the results of war service, and for the children of devastated regions in north France who suffered from exposure during the German occupation. The site of the sanatorium has been selected in the Esterel Mountains, overlooking the Mediterranean. One hundred children now under the care of the American Committee for the Relief of the Devastated Regions of France will be transferred to the sanatorium as soon as it is finished.

Bequests and Donations.—The following bequests and donations have recently been announced:

> National Committee for Mental Hygiene, $100,000; Society for Improving the Condition of the Poor, New York, $200,000; Henry Street Settlement and New York Hospital, each $50,000; Adirondack Cottage Sanatorium, $25,000, by the will of Mrs. Elizabeth Milbank Anderson.
>
> Saratoga Hospital, Saratoga Springs, N. Y., $100,000; New York Society for Relief of Ruptured and Crippled, $10,000; New York Eye and Ear Infirmary, $10,000; Brooklyn Home for Consumptives, $5,000, by the will of Mrs. Ellen D. V. Hazelton, Westfield, Mass.
>
> Union Memorial Hospital, Baltimore, $50,000; Church Home and Infirmary, Baltimore, $60,000, by the will of Mrs. Marie Conrad Lehr, wife of Dr. Louis C. Lehr, Washington, D. C.
>
> The Roosevelt Hospital, New York, for a free memorial bed, $36,250; to St. Luke's Hospital, New York, for a free bed, $35,000, by the will of Henry R. C. Watson of Brandon, Vt.
>
> St. Vincent's Home and Maternity Hospital, Philadelphia, $1,000, by the will of Peter J. Hallahan.
>
> St. Joseph's Hospital, Philadelphia, $250, by the will of Joseph Verner.

Provisional Health Committee.—Official announcement of the membership of the Provisional Health Committee has been received. It is made up of twelve experts selected by the council as private individuals and with no regard to anything but their personal ability and standing. To these are added representatives of the International Labor Office and the League of Red Cross Societies. There is at present no representative from the United States. The health organization of the league, as finally developed, should have the following objects:

> To act as a connecting link between the health authorities of all countries; to act as a clearing house for information concerning everything that constitutes a menace to public health; to form a sort of general staff when an epidemic threatens to overrun a number of countries; to coordinate the efforts of the Red Cross Societies in their work on behalf of "improvement of health, prevention of disease and the mitigation of suffering throughout the world" as prescribed by Article 25 of the Covenant; to cooperate with the International Labor Office for "the protection of the worker against sickness, disease and injury arising out of his employment"; to advise voluntary organizations requesting assistance; and, finally, to establish health missions when asked to do so by the League of Nations or by any country belonging to the league.

Tri-State Meeting at Portland.—The triennial joint meeting of the medical associations of Oregon, Washington and Idaho was held at Portland, Oregon, June 30 to July 2. The registration was nearly 700, representing over one-third the combined membership of the three associations. The meetings were held in the Multnomah Hotel. In addition to papers and demonstrations by members of the three associations, the following visitors appeared on the program: Drs. William F. Braasch, Rochester, Minn.; Robert E. Farr, Minneapolis; Alan Brown of the University of Toronto; R. E. Coleman of the University of Vancouver, British Columbia; Dean Lewis, Chicago; Alfred Strauss, Chicago; G. V. I. Brown, Milwaukee; V. P. Blair, St. Louis; Frank Hinman, San Francisco; Frederick R. Green, Chicago; Judge Harold M. Stephens of Salt Lake City, representing the American College of Surgeons, and Mr. Celestine J. Sullivan, executive secretary of the California League for the Conservation of Public Health. The session was held under the presidency of Dr. Joseph A. Pettit of Portland, who tendered the members and guests a reception at his residence on Thursday evening. On Friday evening the annual banquet and ball was held at the Waverly Country Club, and on Saturday afternoon the entire body was taken for an extended automobile trip along the Columbia Highway, followed by a barbecue and picnic dinner at the Automobile Club Grounds.

American Legion Promulgates Resolution on Hospitalization.—The following resolution was passed unanimously at a meeting of the National Committee on Hospitalization and Vocational Training of the American Legion, held July 6, 1921, at Washington, D. C. As directed by the resolution, copies are to be sent to the 10,042 posts of the American Legion throughout the United States and the resolution will be published in the *American Legion Weekly*, which has a weekly circulation of more than 700,000 copies among ex-service men and women:

> This committee, after duly hearing a report from the Consultants of the Secretary of the Treasury, desires to record its appreciation of the progress made and the work accomplished by the Secretary of the Treasury in allocating the money recently appropriated by the Congress for the expansion of existing federal hospitals for ex-service men. This committee approves highly of the method adopted by the secretary of appointing consultants chosen from the specialists of the country, to advise on the location and type of hospitals to be erected under the aforesaid appropriation and would urge upon the Secretary of the Treasury that he request the consultants to recommend to him such additional provision as in their judgment, after further careful study, may seem to be necessary to complete the hospital program for ex-service men, and furthermore, the National Adjutant is requested to forward a copy of this resolution to every post.

The consultants acting with the Secretary of the Treasury are Drs. William C. White, Frank Billings, George H. Kirby and Chancellor J. G. Bowman.

LATIN AMERICA

Appointments to the Medical Faculty of Bogota.—According to the *Galeria Médica*, to fill the vacancies left by the death of Dr. Fajardo Vega and of Dr. J. del C. Cárdenas, Dr. G. Vergara Rey has been appointed to the chair of tropical medicine; Dr. Jenaro Rico to the chair of medical physiotherapy, and Dr. J. M. Montoya, professor of children's diseases, was appointed on the board of managers.

Inauguration of Laboratory at Ciudad Bolivar.—The *Gaceta Médica de Ciudad Bolivar* gives the addresses made by the director, Dr. F. R. Páez and others at the inauguration recently of the bacteriology and parasitology laboratory of the state of Bolivar, installed in the Hospital Ruiz. The third national medical congress is to convene in that city, July 24, and the principal topic appointed for discussion is the medical geography of Venezuela.

Campaign Against the Hookworm in Paraguay.—The vice consul reports from Asuncion that during a campaign against hookworm last summer, by the department of health, it was discovered that about 83 per cent. of the suburban population of the city of Asuncion and Villarrica were infected. Twenty per cent. of all the deaths in Paraguay are ascribed to this disease. The total population of Paraguay is estimated at 1,000,000, of which 90,000 reside in Asuncion and 34,000 in Villarrica.

FOREIGN

The Göteborg Plan for Dispensaries.—A medical writer in the *Lyon Médical*, describing his impressions from a trip through Sweden, praises the way the free dispensaries are managed at Göteborg. Each applicant presents a certificate of indigence or pays 2 crowns for his consultation.

Zambaco Prizes.—The Société Française de Dermatologie et de Syphiligraphie recently awarded the two Zambaco prizes to Dr. Fouquet for his work on reinfections and superinfections in syphilis, and to Dr. Montlaur for his study of eczematoid lesions in interdigital spaces and folds.

Prize Offered to French Inventor with Three Children.—The Direction des Recherches Scientifiques et Industrielles has recently been endowed with a fund the income of which is to provide two annual prizes, totaling 12,500 francs, to be awarded for some invention made by the father of at least three children.

Centennial of Scientific Society.—The Niederrheinische Gesellschaft für Natur- und Heilkunde recently celebrated at Bonn the centennial of its foundation. The main address in the medical section was by Krause, who reviewed the history of the medical sciences as presented in the society meetings. A number of honorary members were elected, including Professor Forssel of Stockholm.

The Welsh National School of Medicine.—For about thirty years the Cardiff School of Medicine at Cardiff, Wales, has offered the work of the first three years of the British five-year medical course, its students going elsewhere to obtain their clinical training. It is now planned to establish a complete curriculum which will be offered beginning next October. The medical school is to continue as the Faculty of Medicine of the University of Wales.

Personal.—Dr. Belzer of Bordeaux has been awarded the Gratitude of Belgium medal for services rendered to Belgian refugees during the war.——The pupils and friends of Dr. Siredey have organized a committee to collect funds to present him with a medal on the occasion of his retirement from active work in the Paris hospitals. A bronze replica of the medal will be given each one who subscribes 50 francs. Address G. Doin, Librairie Doin, Paris.——Prof. W. Uhthoff retires this year from the chair of ophthalmology at Breslau, having reached the age limit.

Tribute to Maragliano.—The Italian internists hold their annual meeting this year, in October, and it is proposed to celebrate on that occasion the fortieth anniversary of the connection of Professor and Senator E. Maragliano with the teaching force of the University of Genoa. The meeting and the anniversary celebration are to be held at Naples, where Maragliano obtained his degree in medicine. He was the guest of the University of Pennsylvania in 1904 for the Phipps lecture. He is one of the two directors of the *Riforma Medica*, and has long been one of the leaders in pathology and internal medicine in Italy.

Gynecology and Obstetrics Congress.—The Second Congress of the Association of Gynecologists and Obstetricians of French-speaking countries is to convene at Paris, Sept. 29 to Oct. 1, 1921. The subjects appointed for discussion are: disturbance in thyroid functioning in connection with gestation; medical and social protection for the pregnant; indications for abdominal hysterotomy in the course of labor with normal pelvis; hysterectomy in acute puerperal infection; and radium therapy in cases of uterine fibromas (Faure of Paris); in cancer of the uterus (Hartman of Paris); in metrorrhagia under other conditions (Koenig of Geneva). Membership in any French-speaking gynecology or obstetrics society entitles to membership in the congress. The general secretary is Dr. Brindeau, rue de Grenelle 71, Paris.

Guests at Dedication of Peking Union Medical College.—At the dedication of the Peking Union Medical College to take place in Peking, September 15-22, as announced in THE JOURNAL, July 12, the following members of the board of trustees of the Rockefeller Foundation will be present: George E. Vincent, president; Paul Monroe, chairman of the board of trustees; John D. Rockefeller, Jr., Martin A. Ryerson, Chicago; William H. Welch, Johns Hopkins University; J. Oriol Armitage, of the Society of the Propagation of the Gospel in Foreign Parts, England; James L. Barton, Boston, secretary of the American Board of Commissioners for Foreign Missions; F. H. Hawkins, London Missionary Society, England, and J. Christie Reid, of the Medical Missionary Association of London, England. The following physicians have also accepted invitations and will attend the International Medical Conference to take place at that time: Professor Tuffier, Paris; Drs. A. B. Macallum, McGill University, Montreal, Canada; Sir William Smyly, Dublin; R. T. Leiper, London School of Tropical Medicine; Francis W. Peabody, Harvard University Medical School; George de Schweinitz, University of Pennsylvania; Florence Sabin, Johns Hopkins University; S. S. Goldwater, Mount Sinai Hospital, New York; Thomas Cochrane, London; J. G. Clark, University of Pennsylvania; Victor G. Heiser, International Health Board, and Richard M. Pearce, Rockefeller Foundation.

Gratitude Expressed by German Pediatricians.—Our German exchanges publish an official notice drawn up at the annual meeting of the Deutsche Gesellschaft für Kinderheilkunde, held at Jena in May, the first since the war. It states that the society feels it incumbent to express its profoundest gratitude to all those "who during the war and especially since the close of the war have tried to alleviate distress among children in Germany. This gratitude is to all who helped, either in Germany or elsewhere. Beside the German organizations . . . especial thanks are due in particular to the foreign relief on a large scale, especially the children's aid mission of the Quakers of America who, in collaboration with Herbert Hoover's American Relief Administration and European Children Funds have been supplying food since February, 1920, for children of all ages up to 18, and for expectant and nursing mothers; also to the Quaker society of England for their care for refugees and other services; to the Salvation Army for distributing free milk; to the child saving work done by the organizations for the purpose in Denmark, Norway, Holland, Sweden, Switzerland and Finland, sending donations and receiving German children into their homes; to the international organization responsible for the 'Save the Children Fund,' and finally to the committees formed in German colonies in North America, Central and South America, Dutch East Indies, China, South Africa, Brazil, Argentina and other foreign lands, for their donations of money and in particular their gifts of milch cows. Our gratitude is profound for this assistance to our children, and also our appreciation of the spirit of sympathy and helpfulness and reciprocal confidence which is manifest in all these efforts. Only the strengthening of this spirit can bring true peace to peoples." The communication is signed by the president and secretary of the society, Prof. E. Peiper of Greifswald and Prof. H. Brüning of Rostock.

Deaths in Other Countries

Dr. **Carlo Moreschi**, one of the leading physicians of Italy, recently appointed professor of clinical medicine at Messina. He succumbed to hemorrhagic smallpox at Pavia.——Dr. **F. G. Thomson** of Rosario, Argentina, a leader in the organized prophylaxis of venereal disease and of tuberculosis, and professor in the Escuela Industrial de la Nación.——Dr. **John Matthew Fortescue-Brickdale**, Bristol, England; member of editorial staff of the *Bristol Medico-Chirurgical Journal* and author of works on chemistry and therapeutic actions of drugs; died recently, aged 51.——Dr. **William A. Bell**, former practitioner of St. George's Hospital, London; became associated with General Palmer, Colorado, and was interested in the founding of the Denver and Rio Grande Railroad system, of which company he was for many years vice president; associated in the founding and development of Colorado Springs, Manitou, and other Colorado towns, and maintained a residence, "Brairhurst," at Manitou; author of "New Tracks in North America"; died recently, at his home in England, aged 80.——Dr. **E. Lauwers**, chief of public health service in western Belgium and a leading surgeon, member of several scientific societies at home and abroad, aged 63.——Dr. **H. Albers-Schönberg**, professor of roentgenology at Hamburg. He was one of the first to appreciate the importance of the roentgen rays for medicine, and was the first professor of roentgenology to be appointed, and has published numerous works on this specialty. His prolonged work with the rays entailed severe injury. One arm had to be amputated and he has finally succumbed to malignant degeneration of his roentgen burns.——Dr. **H. Brock** of Berlin, founder of the **Balneologic Society**, aged 89.——Dr. **A. Fiedler** of Leipzig, aged 86.——Dr. **L. Knorr** of Jena, who discovered the pyrazolon compounds, including antipyrin, aged 62.——Dr. **A. Lorch** of Vienna.——Dr. **R. Penzini, Jr.**, of Callao and Dr. **M. Hernández** of Maracaibo, both in Venezuela.——Dr. **J. Deutsch** of Munich, said to be the first to apply roentgen treatment to uterine fibromas.——Dr. **A. Würzburg**, long statistician to the national public health service in Germany.——Dr. **J. Fabre**, professor of obstetrics at the University of Lyons, aged 55.

Government Services

Navy Closes Yokohama Hospitals

The Surgeon-General of the Navy has ordered the U. S. Naval Hospital at Yokohama, Japan, closed in the interest of economy. Lack of demand for hospital facilities in Japan has been falling off in recent years and Navy Department decided that there was no occasion for a continuation of this institution. Capt. Raymond Spear, U. S. Navy Medical Corps, who has been in command, will be transferred to other duties with his assistants.

Senate Committee Reports Favorably Reserve Retirement Bill

The Senate Military Affairs Committee has reported favorably to the Senate the Bursum bill calling for the retirement of disabled emergency and reserve officers on the same financial status as the officers of the regular military establishment. Quite a number of emergency medical officers wounded and disabled as a result of their service in the World War will be benefited should the measure pass both houses of Congress and become a law. Senator Bursum introduced the proposed act on the claim that the country was not living up to the provisions of the Army reorganization and the draft act that stated that all officers and enlisted men would be placed on the same footing as regards pensions after their entrance into the Army.

Distinguished Service Medal to Colonel Reynolds and Lieutenant Hull

President Harding has awarded the distinquished service medal to Col. Frederick P. Reynolds, Medical Corps, U. S. Army, for meritorious services as a surgeon of the advanced section, service of supply, American Expeditionary Forces. He is from Elmira, N. Y. For extraordinary heroism in action near Cormicy, France, May 27, 1918, Lieut. Alson J. Hull, U. S. Medical Corps, has also been awarded the distinguished service cross. He is from Troy, N. Y., and was attached to the Fourth South Staffords, British army, in action.

Flight Surgeons

Seven students have recently graduated and received the rating of flight surgeons from the School of Flight Surgeons, at the American Army Medical Research Laboratory, Mitchel Field, Long Island, N. Y.

Changes in Naval Medical Corps

Capt. James S. Taylor, M. C., U. S. Navy, in charge of the division of Naval medical publications, and editor of the *Naval Medical Bulletin*, was detached from the Bureau of Medicine and Surgery, July 15, and assigned to duty as medical officer of the Navy Yard, Philadelphia. He will be relieved by Capt. Frank L. Pleadwell, recently fleet surgeon, on the staff of Admiral Wilson. In addition to his work on the Naval medical publications, Captain Pleadwell will have charge also of the educational activities of the Medical Corps.

Public Health Institute

The proposed public health institute which the U. S. Public Health Service contemplated holding in Washington, D. C., during the fall of 1921, has been indefinitely postponed. This action has been decided on after several conferences between officers of the service and officers of the American Public Health Association.

Public Health Service Takes Over Navy Hospital

The U. S. Public Health Service has taken over the management of the Navy Camp and Hospital at Gulfport, Miss. It will be used for the care and treatment of shell shock soldier patients. Owing to some technical difficulties now in progress of clearing up, no lease has yet been signed for the property. Surgeon G. A. Kempf of the U. S. Public Health Service has taken charge of the hospital with Passed Assistant Surgeon V. L. Mahoney as executive officer.

Foreign Letters

PARIS

(From Our Regular Correspondent)

June 10, 1921.

International Conference on Epizootic Diseases

Last October, following the appearance of cattle plague in Belgium, the Comité consultatif des épizooties of France requested, at the suggestion of its president, that the various governments be invited to appoint delegates to a conference for the purpose of deciding on the proper measures to be taken to prevent, or at least to check the progress of, epizootic diseases. The minister of agriculture, recognizing the value of the suggestion, submitted it to the ministerial council, by which corresponding action was taken. Invitations were promptly sent to foreign governments with the result that they readily entered into the plan. Forty-two countries, colonies or dominions, besides France, expressed their approval and were represented at the conference. In 1871, exceptional conditions analogous to those of today were the occasion for a conference of like nature. The Austrian government at that time took the initiative with the view to establishing uniform rules concerning the prevention of cattle plague, which was spreading over central Europe, Belgium and a large part of France. The Vienna conference worked out a set of regulations of international scope, but, owing to the disappearance of the disease, it was not published. However, the principles therein set forth have served as a basis for all modern legislation on the subject. The conference of 1921 was different from that of 1871 both on account of the large number of governments that took part in it and thus gave it an almost international character, and also because its program was not limited to the adoption of efficacious measures for combating the cattle plague. The French delegation, which had been instructed by the French government to work out the program of the conference, thought it advisable to include the study of methods that might serve to prevent the spread of other epizootic diseases. After a general discussion, during the course of which the delegates of the different governments made known the conditions obtaining in their respective countries, committees were appointed, with instructions to prepare and submit conclusions, which were approved by the conference and presented to the various governments for ratification. Some of the conclusions lay down general principles, while others take the form of resolutions. It appeared that, while complete unanimity was feasible in certain matters, in other points at issue it was preferable to allow a certain amount of freedom to the individual governments. The most important thing is that each government be promptly notified of the appearance of any epizootic disease in a neighboring country, so that it may take the necessary precautionary measures for its own protection. It is equally important that the information on sanitary topics shall be published by the various countries in accordance with uniform rules and shall be given out as frequently as possible. Formal resolutions relative to this subject were adopted. The conference recognized also the desirability of a common bond of union being established between the scientists throughout the world whose double aim it is to discover preventive and curative measures whereby the spread of epizootic diseases may be effectively opposed. Thus every scientist can keep himself informed in regard to the work undertaken and the results secured in other laboratories. He will be able to experiment under conditions often just a trifle different from those under which the experiment was first done. Thus he can control the value and efficiency of work undertaken and results obtained else-

where. The publication of the results (though they be only partial or even negative) of various experiments will prevent the loss of time and energy that would arise from performing experiments which have already been made. Investigations should be confined to researches made with a view to discovering curative methods. They must also include, from the standpoint of prophylaxis, everything pertaining to the spread of the disease, bacteria carriers, the amount of resistance shown by certain species or certain individual animals, and the danger of contamination that may lie in the meat and other products of certain animals, even though they may appear harmless. The conference thus outlined an important program of scientific research, in the carrying out of which the scientists of the world are requested to coordinate their efforts. The realization of this program requires the publication of an international sanitary statistical bulletin and the creation of a bureau that shall serve as a clearing house for all kinds of information. It was also decided to establish a permanent bureau against epizootic diseases and having a similar mission to the bureau which was created about fifteen years ago for the protection of human health and which bears the name of the International Bureau of Public Health. The object of this bureau, as expressed by the terms of the establishing resolution, is to collect and bring to the knowledge of governments and their health departments, facts and documents of general interest concerning the spread of epizootic diseases and the means employed to combat them; to promote and to coordinate all researches and experiments connected with the pathology and prophylaxis of infectious diseases in animals for the accomplishment of which an appeal must be made to international collaboration; to work out forms of international agreements relative to sanitary control of animals, and to place at the disposal of the signatory governments the best means of controlling the execution of such agreements. The conference requested that the headquarters of this bureau be permanently located at Paris, where each year the delegates of the various governments will convene for the purpose of examining into new problems which may arise or into modifications which may be required in international legislation, the foundations of which it has thus laid.

LONDON

(From Our Regular Correspondent)

June 12, 1921.

The Prevention of Venereal Diseases: The Government Policy

As shown in previous letters, ever since the war the prevention of venereal diseases has been a burning question in this country. For some time the government has been considering the modification of its policy, and the result is a circular issued by the Ministry of Health to the local health authorities (county councils). Up to the present the government policy has been based on the recommendations of the Royal Commission on Venereal Diseases which, in the main, are gratuitous treatment at hospitals and other institutions in all parts of the country, and a campaign of publicity and education as to the dangers and the necessity for early treatment. In a few areas, ablution or disinfecting centers have been instituted as an experiment. War experience of the different armies has given rise to the question whether in civil life some further measures should be adopted, and this was considered by a committee appointed by the minister of health. This committee came to the conclusion that, although certain drugs properly and skilfully applied are efficacious in prevention, the most carefully organized system for the supply of these drugs in packets and the instruction of men in their use did not produce such reduction in incidence as to warrant its recommendation to the government. It was, however, found that when preventive treatment by a skilled attendant was provided after exposure, the results were better than when the same measures were taken by the individual, even after the most careful instruction. Unofficially also the question has been under the consideration by a special committee of the National Birth Rate Commission. The government has given careful consideration to the question on which these two committees are not agreed—the question of self-disinfection—but they are in general agreement that (1) abstention from promiscuous intercourse is the best way to avoid risk of disease, and a steady and continuous policy of public enlightenment is essential; (2) disinfection immediately after exposure is effective only to the extent to which it can be thoroughly and intelligently applied. They also find that medical opinion is divided as to the efficacy of disinfection for the civil population and in particular as to (*a*) whether it is practicable to give such instruction to the population generally as will insure that disinfectants are thoroughly and skilfully applied; (*b*) whether propaganda as to the efficacy of disinfectants would not lead to persons risking infection who would otherwise avoid it, and (*c*) whether the disinfectants will not be used in some cases for treatment with the result that proper treatment will be delayed. The government is thus confronted with this difference of opinion on the medical side as to self-disinfection, while on the moral and social side weighty objections are advanced against it. It has therefore decided that it cannot give it official support. It considers that this decision emphasizes the importance of continuing and extending public instruction and enlightenment as to the danger of promiscuous sexual intercourse. It recommends the widespread use of leaflets warning the public of the prevalence of venereal disease, pointing out that it is the duty of all who have incurred the risk to cleanse themselves thoroughly and immediately, and if the slightest symptoms occur to seek medical treatment promptly. The arguments against official advocacy of self-disinfection are not considered to apply to the provision of ablution centers under medical supervision, but experience is not yet sufficient to decide whether such centers should be established in large towns.

The Decrease of Typhoid Fever

Dr. W. H. Hamer, health officer for London, considers that among the factors operating in producing the great fall in typhoid prevalence of the last twenty years, amelioration of conditions obtaining in connection with the harvesting of fish and shellfish from inshore waters have played a not inconsiderable part. The oyster scare of the nineties diminished consumption of oysters, and led to improvements in cultivation and storage. For many years, however, cockles and mussels derived from grossly polluted sources continued to be supplied to the poorer population of the large towns, and to be consumed locally at seaside resorts. The practical disappearance of the Tees oyster and mussel fishery was accompanied by a remarkable fall in the greatly excessive amount of typhoid fever in Durham. Dr. Hamer quotes Professor Gardiner for the statement that so long as the oyster shells remain closed and do not lose their shell water, the oysters remain good for human consumption, and cannot be infected on their journey to the customer. Noting Gardiner's description of the process of "teaching the oyster to keep its mouth shut," Dr. Hamer also recalls his optimistic view that "cases of typhoid infection from oyster beds are now almost nonexistent."

As regards fish, three outbreaks occurred in London in September, 1900, which were attributed to this source, and it was found that small fish which were used ungutted were specially dangerous. Dr. Hamer thinks that the need for systematic inspection with a view to destruction of fish and shellfish unfit for consumption, the desirability of protecting

the nurseries of the small fish, of prohibiting the sale of ungutted flatfish, and of coping with the problem of the unsatisfactory shellfish beds calls for attention if the position as regards preventing spread of typhoid is to be not merely maintained, but still further improved on, until at length the goal is attained—the entire abolition of the disease.

Eugenics

At the annual meeting of the Eugenics Education Society, Major Leonard Darwin, in his presidential address, said that eugenics had been called a dismal science, but it should be described as an untried policy. Both in genetics and eugenics further advances in knowledge were much needed, and many inquiries were now held up only for want of funds. The wisdom of attending to breed in the case of cattle and dogs was universally admitted. Experience in the stockyard enabled us better to understand the laws of natural inheritance; but reliance on those laws did not imply that the methods of the animal breeder should be introduced into human society. Eugenists advocated nothing contrary to the highest religious ideals. They had been accused of wishing to abolish love as a guide to conduct, but that was false. They wished to purify it of all harmful influences. Love was largely aroused by advantageous moral and mental qualities, and it found this the firmest foundation on which to base a eugenic policy. By promoting right ways of regarding sexual problems, the moralist was often, unknown to himself, striving to improve the racial qualities of the future generations. We should encourage the discussion of all relevant reforms, but should be cautious in recommending governmental interference. If action was too bold, progress would be slow, for the wrong road would often be taken. If discussion was not bold, progress would also be slow, for a nation could not grope its way quickly in the darkness of ignorance. As to sterilization, for example, by open discussion true conclusions would be most likely to be reached.

PEKING, CHINA

(From Our Regular Correspondent)

May 15, 1921.

Plague Situation

Since my letters on the plague and famine in China, there have been a few new developments. Following the rather surprising outbreak of plague on the borderline between the two provinces of Shantung and Chihli, several small epidemics started in neighboring places and for a time caused great concern. However, they were promptly placed under the control of the medical authorities and have gradually died out, but not without the sacrifice of one of the Chinese physicians, a recent graduate of the old Peking Union Medical College. The plague in Manchuria is gradually disappearing without developing alarming proportions, thanks to the intensive preventive measures used against it by the North Manchuria Plague Prevention Service under Dr. Wu Lien Teh. The famine distress has been further augmented by the lack of rain during March and the first part of April. In many places the winter wheat has been destroyed. This grain, normally maturing in June, was counted on to break the back of the famine. Although later crops of other foods will take the place of winter wheat, the delay will necessitate the support, for a much longer period, of those whom the Famine Relief Committee has elected to carry through until harvest time.

Clubs Formed of Faculty of Peking Union College

The faculty of the Peking Union Medical College has organized the Journal Club, with Dr. Oswald Robertson of the department of medicine as its president, and Dr. Carl TenBroeck of the department of pathology as its secretary. Meetings are held biweekly and reviews of current articles and monographs of general interest are discussed.

Another organization of the staff is the Faculty Medical Society. Dr. Jocelyn Smyly of the department of medicine is its president, and Dr. Henry Meleney of the department of pathology is its secretary. This society also meets biweekly, alternating with the Journal Club. At some of the meetings the progress or result of the researches being conducted by the members of the staff is reported. At others, clinical material is presented. Once a month the Peking branch of the China Medical Missionary Association meets conjointly with the Faculty Medical Society and takes part in the program.

Streptococcic Epidemic

The winter has been a severe one from the point of view of infectious diseases. One of the most important phases of this has been an epidemic of hemolytic streptococcus sore throat, with middle ear disease and mastoiditis.

Nervous and Mental Diseases

Cerebrospinal syphilis and its degenerative sequelae are conspicuous both in frequency and in gravity. Tabes dorsalis and general paresis appear to be at least as frequent here as in American clinics. Primary tract degenerations and the muscular dystrophies are evidently not infrequent among the Chinese. The infrequency thus far of trigeminal and other severe neuralgias in this service is surprising, since pain is the symptom which brings the Chinese most promptly to the western physician. For the indolent degenerative diseases they are more likely to content themselves with the native practitioner, at least until resulting motor weakness stirs them to overcome their inborn conservatism. Many of the cases of epidemic encephalitis (lethargic) have been of the myoclonic type. Mental defectives of all grades are frequently encountered. Dementia praecox has been the commonest of the psychoses. Psychoneuroses are frequent among the Chinese. A violent fit of anger is a cause commonly assigned by the patient or the family for the ensuing train of symptoms.

BUDAPEST

(From Our Regular Correspondent)

May 19, 1921.

Influence of Alcoholism of the Mother on the Offspring

At the recent meeting of the medical society, Dr. Darvas said that the pernicious influence on the offspring of habitual parental inebriety is a well recognized factor in pathology, and statistics seem to show that this cause is vastly more operative when of the two parents the mother is the sinner. This, indeed, is only what one would anticipate, in view of the fact that for nine months the fetus remains exposed to the baneful influence of the alcohol, taken persistently. Sobriety on the part of the father has little effect so far as the health and vitality of the child is concerned, and in presence of maternal drunkenness may almost be discarded, although no doubt the result of two bad strains would intensify the consequent mischief. The influence of chronic parental inebriety in this connection bears mainly on the higher departments of the nervous system, producing more or less marked intellectual inferiority and a functional incapacity on the part of what may be described generally as the moral function of the brain. For instance, the children of drunken mothers are liable to become epileptic, hysterical or neurasthenic, are predisposed to infantile paralysis, and have an imperfect conception of the moral obligation of truth in spite of careful training which, by the way, they do not usually get. Their emotions and passions cannot be brought under adequate control; consequently they furnish a large contingent to the criminal and to what the criminologist would call the irresponsible classes. Looked at from this point of view, it becomes obvious

that criminal tendencies are of the nature of a constitutional disease to be dealt with preventively and therapeutically rather than vindictively.

Leprosy in Herzegovina

Dr. Vokurka has returned from Herzegovina (Jugoslavia), whither he betook himself for the purpose of study in loco the probable causes of the prevalence of leprosy in that country. He found that the disease is very sparingly distributed over Bosnia and Herzegovina (before the war parts of the Austro-Hungarian monarchy), and is nowhere very abundant and affects primarily the native population. Dr. Vokurka surmises that it was probably a new disease when first recognized in Sarajevo some 150 years ago, since which time it has gradually extended over the whole country. The principal point of interest in these observations is the confirmation which Dr. Vokurka has found of his theory that leprosy is due to deficient alimentation, the consumption of badly cured mutton. This fact is in harmony with the finding of Prof. Jonathan Hutchinson, who found in studying leprosy in South Africa that the disease is due to the consumption of badly cured salt fish. Dr. Vokurka is constrained to admit that the evidence is in favor of the disease being sometimes communicated from man to man, not, however, by direct contagion, but by the consumption of food contaminated by manipulation by leprous persons. As this method of transmission is possible only under cover of the grossest hygienic neglect, its spread mainly among the poorer classes is explained. The conclusions formulated by Dr. Vokurka are in favor of legislative control of the sale of food, the education of the public as to the methods of transmission, and the establishment of small leper homes into which the victims of the disease should be induced to go during the infectious period.

Human Actinomycosis in Bukowina

The district medical officer in Czernovitz has been notified that near the Bessarabian border there are some human actinomycosis cases. He duly started to visit this district and examined all the reported cases. The affection was in nearly every case (eleven) on the face or the neck. In each case the clinical diagnosis was confirmed by the microscopic examination of the pus. To these eleven cases he would add five others, noted by a colleague in Kisinan which, added to all those published, gave a total of thirty-six cases of human actinomycosis known up to the present in the mideastern part of Europe. Out of the thirty-six cases, twenty-one were localized in the face and neck and fifteen in the viscera. As regarded the prognosis of that affection, the district officer was able to procure information on the final lot of about 250 patients both at home and abroad. By these documents it was found that the mortality, which was only from 2 to 3 per cent. in the cutaneous forms and 10 per cent. in the cervicofacial forms, rose to 30 per cent. when the malady was deeply situated in the temporomaxillary region, to 65 per cent. in abdominal actinomycosis of intestinal origin, and to 85 per cent. when the liver or cerebrospinal system was attacked. The gravity of the visceral forms arose from the difficulty of treating due to the extended infiltration of the malady.

Infection of the Ears of Schoolchildren

An interesting and important report was laid before the Medical Society of Budapest by Dr. A. Müller, who examined the ears of 500 schoolchildren. The investigation was undertaken with the object of ascertaining the amount of ear disease in children of the poorest class, and if necessary, of drawing attention to the subject. Various tests were adopted, into which it is needless here to enter, save in the case of the meaning placed on the term "normal." By this was meant that the membranes appeared normal and that the whispered voice could be heard at a distance of 6 meters. Inability to pass this test with one or both ears was present in 245 out of 500 children. Foreign bodies were found in the ear in eleven children, eight of whom were girls. Out of eighty-seven cases of deafness there were adenoids in sixty-one; 127 of the total number of children had discharge from one or both ears, and in forty-three cases the discharge was suppurative. The number who had previously suffered from middle ear discharge was 123, and of these sixty-nine had adenoids, and perforation was present in twenty-four, while adenoids were found in all in 214 children, of whom 189 presented some aural troubles. Dr. Müller finally raised the question as to what steps should be taken in the matter by the authorities. He recommended that the systems employed in Germany, England and Sweden should be investigated and reported on.

VIENNA

(From Our Regular Correspondent)

June 8, 1921.

A One Day Strike of Physicians in Austria

The serious dissatisfaction of the medical profession with the behavior of the government toward them has aroused angry feelings among physicians, as explained in my previous letter. The often threatened manifestation of this feeling took place a few days ago when all practitioners in this country stopped working for a day as a demonstration against the government. Both the physicians in the country and those in the towns were invited to attend a mass meeting in the large assembly hall in Vienna, and upward of 2,000 of them were present when a resolution embodying the demands of the profession was unanimously carried. The medical councils and the medical organizations had united their efforts to bring about a universal action; all hospitals, ambulances, charity institutes, private physicians and clinics on that day stopped working. Only absolutely necessary first aid was rendered by the few men delegated for that purpose. All other men had to be present at the mass meeting, and for the first time in the history of medicine in this country we had no "outsider." The demonstration has proved to the government that, if necessary, the medical organization and corporations have their members sufficiently under control to insure absolutely efficient working of a strike if that should be deemed necessary. And the government was also made well acquainted with the demands of the profession, for the resolution mentioned above contains the following points: The medical profession demands that in all questions pertaining to the social welfare of the population or the profession alone, the opinion of the authorized representatives of the medical profession be asked before such bills or acts be drafted, and such opinions be duly considered according to economic interests of physicians; that a medical act be at once brought before the National Assembly regulating the rights and duties of physicians and permitting that the interests, both ethical and material, of the profession be duly looked after; the antiquated sickness insurance institutions should be reorganized from a modern standpoint. The interests of the insured persons should be brought into better relation with the economic conditions of both parties concerned. For this purpose, an immediate formation of a special committee on that subject is demanded. A supreme board of health, in which the medical men would have to be given the absolute majority of the members, is required. The profession does not object to the cooperation with nonmedical men, but their number must not be overwhelming, as hitherto. The ministry of health should be made independent and not form merely a department of another ministry, as hitherto. A new public health act is demanded, giving proper attention to the achievements of modern science, especially prophylaxis and hygiene. The officials of the state are to be held respon-

sible for all damage caused by their doings to the health of individuals just as much as any other private person. Compulsory instruction in hygiene is recommended for all schools, permission to treat the diseased human body to be granted only to fully qualified medical men after serving a period of two or three years in hospitals. There should be insurance against sickness and invalidity, as well as old age pensions, for all doctors of medicine. A modern reform of the medical curriculum is demanded, and compulsory free postgraduate instruction by courses every few years combined with practical classes. The profession, which for years has been asking and petitioning in vain, without receiving anything else but vague promises, has now lost its patience; and unless the government gives definite and convincing proof of its willingness to comply with the justified demands of the profession within four weeks, physicians are prepared to fight it out and stop all their work. It may be mentioned that while formerly a large proportion of the profession abhorred the idea of a medical strike, now all corporations, including the professors of the universities, the officers of public health and the nonpracticing doctors of medicine are unanimous as to the admissibility of this modern weapon in the fight for the existence of the profession. And even the laity is in favor of the attitude of the profession, however strange this may seem. We have learned here that the men at the head of the state at present are not accessible to the arguments of common sense unless they are backed by a more or less comprehensive display of suave force. The position of physicians is much strengthened by the fact that the public finds it does not get the benefits it is entitled to from the existence of an excellently educated body of physicians in this country of old medical fame.

Precarious Position of the "House Physicians" in Vienna

A large percentage of the general practitioners in this city are in a critical economic position, as was pointed out at one of the recent meetings of the "Economic Organization." The former house physician is virtually dying out. The bulk of the middle classes are now unable to procure any pay for the services of a private physician and must turn to hospitals and outpatient departments and give up all idea of comfort during illness. Apart from the small number of specialists and surgeons or internists who practice among the newly rich, physicians had to apply for one of the posts in the Krankenkassen or sickness insurance clubs. The pay thus obtained is the chief income of the majority of physicians. If we take also physicians appointed in the theaters, and in public health offices or other private or public corporations, more than 70 per cent. of all practitioners of this city are receiving a fixed salary and their time is taken up by such offices. Still these sources of income are not sufficient to enable the physician to keep up the former standard of life. Servants or carriages are things of the past with the vast majority of us, and numerous physicians and their families are patrons of the war kitchens, where food is rather below the caloric standard requisite for the hard work done by the men. New clothes, books, and attendance at the theater or concerts are luxuries at present, not admissible for the average physician, and the "Economic Organization" has all hands full of work to assist many men, whose social and moral position is at the verge of becoming intolerable. The report on which the remarks of this paragraph are based was read at the meeting of the committee and was not intended for public notice, because it was deemed harmful to let the public know exactly how badly off some of our confrères are.

Lack of Cadavers for Dissecting

The smooth course of instruction of the would-be young physician of bygone days has given place in many instances to serious difficulties, owing to lack of money. The expenditure for chemical reagents, apparatus and rabbits or dogs, to say nothing of bigger animals or books, has become too heavy a burden for many laboratories and institutes. These drawbacks can be overcome, as soon as money is forthcoming either from the state or from private sources. But there is another important difficulty, not surmountable by money alone. The dissecting theaters of our anatomic institutes are lacking dead bodies. This is due directly to the downfall of the empire, for formerly sick people from all parts of the vast country, comprising more than 50,000,000 inhabitants, flocked to the medical center, Vienna, and many persons died here in the hospitals, without the bodies being claimed by their friends. Now we have a reservoir of only 6,000,000 to draw on, and even in every middle-sized town there are good hospitals, so that the influx to Vienna is diminished still farther. And those who do die in the city's hospitals are nearly all claimed by their friends. The result is that the students of the first semester have to restrict themselves to the study of skeletons or preserved wet or dry specimens, and to watch the few luckier groups dissect a casually obtained corpse, and wait until something falls to their lot in the same line. Of course, such a state of things cannot be permitted to go on. It is paramount that a law be passed, securing ample opportunity for dissecting by regulating which body can and which cannot be claimed by the authorities of the faculty for purposes of instruction.

BERLIN

(From Our Regular Correspondent)

May 21, 1921.

Roentgen-Ray Treatment of Malignant Growths

At the recent Berlin meeting of the German Surgical Society, Professor Perthes of Tübingen gave a detailed report on the roentgen-ray treatment of malignant tumors. Passing over matters of technic, he considered mainly the problem as to what roentgen-ray treatment had accomplished and what attitude we are to take toward it in viewing the indications for operative intervention. Of course, radium treatment and combined radium and roentgen-ray treatment were also discussed. Skin carcinomas, not only basal-cell but also squamous-cell cancers, can be cured by irradiation without operation. If carcinomatous glands are present, success is not so certain. In carcinomas of the lip treated by roentgen irradiation, freedom from recurrence could be established after three years in 80 per cent. of the cases. The cosmetic result is better than is secured by operation. Likewise in carcinoma of the penis, freedom from recurrence was observed for a period of three and a half years. Carcinomas of the mucous membranes react poorly to roentgen rays but better to radium. In carcinoma of the tongue, combined treatment may be successful. In tumors of the jaws, surgery has made great progress, so that here roentgen irradiation need not be considered. In carcinomas of the pharynx and larynx, clinical cures can be effected by roentgen irradiation, but recurrences soon present themselves. Only in carcinoma of the larynx located above the vocal cords has roentgen irradiation accomplished favorable results; carcinomas occupying a lower position should be operated on. In esophageal carcinoma favorable results have occasionally been brought about by combined radium and roentgen-ray treatment. However, during treatment, edema of the glottis frequently occurs, which may render tracheotomy necessary. In carcinomas of the gastro-intestinal tract there is no reason to depart from operative treatment. In carcinoma of the rectum the problem does not appear to be solved as yet. Of five cases receiving combined radium and roentgen-ray treatment three resulted fatally; two patients are still alive thirty-four months after the treatment and are in very good condition. Carcinoma of the breast should receive operative treatment, as roentgen irradiation effects only a

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clinical cure and recurrences soon appear. Also in carcinoma of the uterus only a few selected cases are suited to roentgen irradiation. Therefore, only cutaneous cancers of the lip, possibly carcinomas of the tongue and esophagus, laryngeal tumors above the vocal cords and perhaps certain rectal carcinomas are amenable to roentgen irradiation. All other cancers should be operated on, with the exception of a certain number of uterine carcinomas. Also in the case of inoperable carcinomas good results may be accomplished within definite limits, but lasting results are the exception. However, by means of radium and roentgen-ray treatment it is sometimes possible to so influence inoperable tumors as to make them operable. Whether or not carcinomas of the stomach should be subjected to roentgen-ray treatment appears rather doubtful in view of the unfavorable results hitherto secured. As for postoperative prophylactic treatment, Perthes, and likewise Tietze and Payr, have not achieved very good results. Perthes observed more recurrrences than usual, especially during the first year, which induced him to give up prophylactic irradiation. Of the sarcomas, the lymphosarcomas react well to roentgen rays. In the case of periosteal sarcomas, roentgen irradiation should be given a trial. As for myelogenic sarcomas, operation is preferable if resection will serve the purpose. If resection is not sufficient but removal seems alone adequate, roentgen irradiation should be tried. Sarcomas of the upper jaw should be given operative treatment, whereas gliomas of the brain and hypophysial tumors react well to roentgen irradiation. Also fibrosarcomas of the nasopharynx are adapted to irradiation. The primary and late injuries following roentgen irradiation (*roentgenkater*, or roentgen sickness and roentgen cachexia) should not be undervalued, but the principal drawback of roentgen irradiation is the uncertainly of the results. Perthes doubts whether there is any such thing as a carcinoma dose in the sense that Seitz and Wintz use the term. We can only speak of a minimal carcinoma dose. All tumors do not react alike to roentgen rays; in fact, within the same tumor the various cells react differently. However, Perthes holds the view that the roentgen rays react differently on the spot to which they are applied. By means of biologic experiments their effect on cell division, karyokinesis, has been established. They exert a special influence on the growing cell. Their action on the cells is elective. Ova and spermatozoa, white blood cells and tumor cells are damaged more by roentgen rays than are other cells in the vicinity. But this effect on the cell does not constitute the whole effect of the roentgen rays. A change is brought about in the whole organism. Not only a plus of roentgen rays is injurious; also too small doses damage through their irritative effect (carcinoma arising after roentgen-ray treatment). Furthermore, through roentgen irradiation defensive forces in the organism are mobilized and an accentuation of the healing processes is attained.

Chief Medical Inspectors of Schools in Berlin

In Germany, as is well known, there are two distinct kinds of school physicians: the chief medical inspectors of the *Hauptamt* and the assistant medical inspectors of the *Nebenamt*. The increasing demands of school hygiene have fortunately brought it about that the latter are decreasing while the former are increasing. Through the influence of the authorities the same process is going on in Greater Berlin. The duties of school physicians are to be considerably increased. A thorough examination of all schoolchildren at least twice during the period of school attendance is contemplated. Furthermore, it is planned to introduce a new type of health certificate, one of which will be made out for each child and which will be kept up to date by the school physicians. Medical inspection of schools is no longer to be confined to the *Volksschulen* (elementary and grammar schools) but is to include also higher institutions of learning and professional, industrial and continuation schools. It is estimated that the inclusion of the higher institutions would bring the number of children in Berlin to be examined by school physicians up to 230,000. In accordance with this plan, six chief medical inspectors are to be added to the present force. The fifty assistant medical inspectors are to have the oversight of 3,500 children each, at the most; whereas heretofore they have inspected more than 4,000.

Marriages

CLARENCE AXTELL PENMAN to Miss Annie Elizabeth Lanier, both of Beaumont, Texas, at Houston, Texas, June 29.

FRANCIS XAVIER KEARNEY, Baltimore, to Miss Louise A. Jaon of Brittany, France, at Baltimore, June 30.

EVERETT RUSSELL FERGUSON, Toms Creek, Va., to Miss Amelia Brizzie of Chattanooga, Tenn., June 22.

DAVID C. MCCULLOUCH, U. S. P. H. S., Camp Kerney, Calif., to Miss Zorayda Lorimer, Denver, March 12.

LOUIS FERNALD FOSTER, Bay City, Mich., to Miss Kathryn Mae Keller, Philadelphia, June 11.

GEORGE ELMER KALTER, U. S. Navy, to Miss Vera Stevenson of Maplewood, N. J., May 31.

SAMUEL MCKEE LOUGEAY, Belleville, Ill., to Miss Emma Kuhn of Brentwood, Ill., July 2.

LAURENCE E. HINES, Bozeman, Mont., to Miss Corys E. Zinn of Flanagan, Ill., June 29.

CHARLES E. LYDAY, Gastonia, N. C., to Miss Naomi Davie Pool of Kinston, N. C., June 28.

LAWRENCE DRAPER, Chicago, to Miss Minta Watkins of Peoria at Ottawa, Ill., June 28.

WELLS TEACHNOR, JR., to Miss Marguerite Putnam, both of Columbus, Ohio, June 2.

CLAUDE F. OSBORNE to Miss Anna Cronin, both of Hampton, Iowa, April 12.

FLOYD M. COLLINS, Clarks, Neb., to Miss Clara Beck of Peru, Neb., May 21.

CHARLES REIFSCHNEIDER to Miss Viola L. Barnett, both of Baltimore, June 28.

FORREST BERTRAM AMES to Miss Mildred Mabel, both of Boston, June 8.

JOHN J. GLEESON, Omaha, to Miss Grace Peters, Red Oak, Iowa, June 8.

Deaths

Charles Hermon Thomas, Philadelphia; University of Pennsylvania, 1865; assistant surgeon, Civil War; member American Ophthalmological Society; and at various times connected as physician and surgeon with the Pennsylvania Hospital, the Wills Eye Hospital, the Lying-In Charity and Woman's Hospital; died, June 28, aged 82. He was professor of materia media and therapeutics at the Woman's College and visiting surgeon at the Philadelphia Hospital; also one of the founders of the Obstetrical Society, a fellow of the College of Physicians, and a member of the Medical Society of the State of Pennsylvania.

Michael D. Healy, Denver; Denver and Gross College of Medicine, 1906; L.L.M., 1907, R.C.P., Ireland; L.L.M., 1907, F., 1908, R.C.S., Ireland; member of staff, St. Joseph's Hospital, Denver; member of the Colorado State Medical Society; captain, M. C., Canadian Army, in World War; died, June 24, from heart disease, while on a fishing trip in the mountains near Denver, aged 40.

George Phillip Stallman ● Baltimore; Indiana Medical College, 1906; served in Spanish-American War; major in Medical Officers' Reserve Corps; Lieut., M. C., U. S. Army, 1918; on staff of General Hospital No. 2, Fort McHenry, Baltimore; died, while on leave, June 23, at Irondequoit, N. Y., from drowning, aged 45.

● Indicates "Fellow" of the American Medical Association.

Jefferson S. Near, Watseka, Ill.; Hahnemann Medical College and Hospital of Chicago, 1876; was several times mayor of Watseka, and under President Cleveland's administration, served as member of local board of the United States Pension Commissioners; died in June, aged 73.

Cyrus B. Newton, Stafford Springs, Conn.; Yale Medical College, 1856; at one time president of the Connecticut Medical Society; member state legislature, 1880; warden state prison, 1881-1893; died at the Johnson Memorial Hospital, June 19, aged 90.

Ward Evans Hunt, Little Falls, N. Y.; Albany Medical College, Albany, N. Y., 1893; member of the Medical Society of the State of New York; former coroner of Herkimer County; died, June 25, at the Faxton Hospital, Utica, from diabetes, aged 53.

Ferdinand, T. Field, Elroy, Wis.; University of Michigan, Ann Arbor, 1884; member of State Medical Society of Wisconsin; died, June 22, from burns received when an electric light, placed on his chest to relieve pain, ignited the bedclothes, aged 70.

Alfred D. Sawyer ● Fort Fairfield, Me.; University Medical College, New York, 1880; also an oculist; served on the United States Board of Pension Examiners, resigning 1900; member state legislature, 1919-1920; died, June 20, from cancer, aged 66.

Edward S. Vanderslice, Philadelphia; University of Pennsylvania, 1864; for forty-two years resident physician at the Philadelphia Dispensary; member of the Medical Society of the State of Pennsylvania; died, June 28, from Bright's disease, aged 78.

William Melville Parry, Waynesburg, Pa.; Miami Medical College, Cincinnati, 1866; Civil War veteran; practicing physician in Greene County for nearly half a century; died in June from general debility, aged 78.

Nathaniel Greene Stanton, Newport, R. I.; Harvard University, Boston, 1866; captain in the Civil War; practitioner in Newport for over fifty years; died suddenly, July 1, aged 83.

William A. Lille ● Monterey, Calif.; Bellevue Hospital Medical College, N. Y., 1895; twice mayor of Monterey; took his own life, June 22, by shooting himself through the mouth, aged 53.

Lycurgus L. Staton ● Tarboro, N. C.; New York University Medical College, 1869; a practitioner for fifty years in Tarboro; died, July 1, from heart disease, aged 72.

Richard P. Berry, West Union, Iowa; Medical Faculty of McGill University, Montreal, Quebec, 1888; member of the Iowa State Medical Society; died, April 17, aged 59.

Henry B. Nightingale, Philadelphia; Jefferson Medical College, Philadelphia, 1876; one of the founders of the Charity Hospital, Philadelphia; died, June 23, aged 66.

Benjamin Levin Hill, Stuttgart, Ark.; Arkansas Industrial University, Little Rock, Ark., 1891; member of the Arkansas Medical Society; died, June 20, aged 53.

Anthony E. Hershiser, Reno, Nev.; Miami Medical College, Cincinnati, 1880; Jefferson Medical College, 1884; died, June 27, from pneumonia, aged 68.

Charles Weil, Buffalo; University of Buffalo, 1882; member of the Medical Society of the State of New York; died, June 16, aged 62.

Lowell Ingersoll, Chicago; Hahnemann Medical College and Hospital of Chicago, 1896; died, July 1, from biliary calculi, aged 58.

Ella B. Cox, Pana, Ill.; Women's Medical College of Cincinnati, 1889; died, July 5, from nervous trouble, aged 62.

Frederick Walter Eberlein, Lacon, Ill.; Rush Medical College, 1886; died, June 20, from heat prostration, aged 61.

George Morgan Ockford, Ridgewood, N. J.; Homeopathic Hospital College, Cleveland, 1872; died, June 26, aged 76.

Madison Bryant, Eubank, Ky. (license, Kentucky, 1895, thirty-one years of practice); died, June 18, aged 82.

John C. Wood, Portland, Ore.; Medical Department, Butler University, Indianapolis, 1879; died, June 28, aged 71.

Henry J. de Haan, East St. Louis, Ill.; Missouri Medical College, 1884; died, June 25, from cancer, aged 63.

George Herbert Fox, Janesville, Wis.; Bellevue Hospital Medical College, New York, 1869; died, June 28.

Bela J. Ward, Albany, N. Y.; Albany Medical College, 1884; died, June 25, after a long illness, aged 63.

The Propaganda for Reform

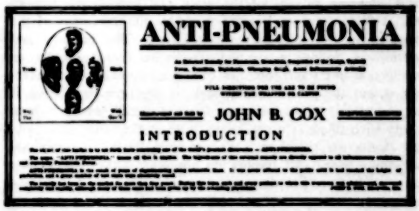
IN THIS DEPARTMENT APPEAR REPORTS OF THE JOURNAL'S BUREAU OF INVESTIGATION, OF THE COUNCIL ON PHARMACY AND CHEMISTRY AND OF THE ASSOCIATION LABORATORY, TOGETHER WITH OTHER GENERAL MATERIAL OF AN INFORMATIVE NATURE

MORE MISBRANDED NOSTRUMS

Abstracts of Recent Notices of Judgment Issued by the Bureau of Chemistry of the U. S. Department of Agriculture

Hobo Kidney and Bladder Remedy.—A quantity of this article, shipped in June, 1920, by the Hobo Medicine Co., Shreveport, La., was declared misbranded by the federal authorities. The stuff was represented as a treatment or cure for Bright's disease, backache, rheumatism, inflammation of the bladder, etc. These claims were declared false and fraudulent. In November, 1920, judgment of condemnation and forfeiture was entered and it was ordered by the court that the product be destroyed.—[*Notice of Judgment No. 8710; issued April 27, 1921.*]

Anti-Pneumonia.—In March, 1917, John B. Cox of Maryville, Mo., shipped a quantity of this preparation which was declared misbranded. Analysis of a sample of the article by the federal chemists showed it to consist of a brownish-black, viscid semi-liquid containing chiefly wood tar, mineral



matter similar to talc and a small amount of glycerin. It was falsely and fraudulently represented as a remedy and cure for bronchitis, acute inflammatory and articular rheumatism and suppressed menstruation and as a remedy for typhoid fever, diphtheria and measles. In September, 1919, John B. Cox pleaded guilty and was fined $10 and costs.—[*Notice of Judgment No. 8791; issued May 13, 1921.*]

Gon-Kure.—A quantity of this article alleged to have been shipped by the Gem Medicine Co., St. Louis, Mo., in April, 1919, was declared misbranded. The preparation consisted of a fluid for injection and tablets for internal use. The Bureau of Chemistry reported that the injection consisted of glycerin and water with small amounts of boric acid, zinc sulphate, phenol (carbolic acid), menthol, hydrastis and alcohol. The tablets, according to the same authority, consisted essentially of magnesium carbonate, copaiba, cubebs and santal oil. The product was falsely and fraudulently labeled as an effective remedy for gonorrhea and acute or chronic cystitis. In October, 1920, judgment of condemnation and forfeiture was entered and the court ordered that the product be destroyed.—[*Notice of Judgment No. 8675; issued April 28, 1921.*]

Potasul Potash Sulphur Water.—The Potash Sulphur Springs, Inc., Hot Springs, Ark., shipped a quantity of this preparation in July, 1916. Analysis of a sample showed that the constituents after which the product was named were not the predominating constituents of the water nor were such constituents the characteristic or distinguishing element of the water. The product was declared misbranded because the name represented that the article was a water containing an appreciable amount of potash and sulphur, whereas, "in truth and in fact it was a water which contained only a trace,

if any, of potash and sulphur." Furthermore, it was falsely and fraudulently represented as a cure for diseases of the stomach, bladder and kidneys "when, in truth and in fact, it was not." In October, 1920, the case having come on for final disposition, and the defendant company having failed to appear, judgment by default was entered and the court imposed a fine of $50 and costs.—[*Notice of Judgment No. 8641; issued April 26, 1921.*]

Short Stop Injection and Short Stop Capsules.—A quantity of these products, consigned in April and November, 1918, and May, 1919, respectively, and labeled in part "Prepared by the Massman Chemical Co., Covington, Ky.," was seized by the federal authorities on the charge that the preparations were misbranded. The Bureau of Chemistry reported that analysis showed the "injection" to consist essentially of a dilute solution of zinc phenolsulphonate, berberin sulphate, a trace of phenol (carbolic acid) and a bismuth salt in suspension. The same chemists reported that the contents of the "capsules" were methylene blue, sodium bicarbonate and salol. The preparation was falsely and fraudulently represented as a cure for gonorrhea and gleet and for "Leucorrhea, Kidney and Bladder Affections, Chronic Seminal and Mucous Discharges." In March, 1920, judgment of condemnation and forfeiture was entered and the court ordered that the product be destroyed.—[*Notice of Judgment No. 8604; issued April 26, 1921.*]

Fisher's Indian Remedy.—Anthony Fisher, trading as the Anthony Fisher Co., Salt Lake City, Utah, shipped in March, 1919, a quantity of Fisher's Indian Remedy, which was misbranded. The Bureau of Chemistry reported that the product consisted of uncoated compressed tablets containing aloes, emodin, strychnin, saponin-like glucoside, reducing sugars, and talcum. The claims in the trade package represented the product to be an effective remedy, treatment, cure and preventive for indigestion, stomach trouble, sick and nervous headache, neuralgia, kidney and liver complaints, rheumatism, pimples, syphilitic affections, female weakness, hay fever, catarrh, eczema, paralysis, insanity, diseases of the liver, failing eyesight, gallstones, cancer, piles, ovarian dropsy, Spanish influenza and stomach ache. There were also a few more conditions which it was said to cure. In July, 1920, Fisher pleaded guilty to making false and fraudulent claims and was fined $25.—[*Notice of Judgment No. 8663; issued April 28, 1921.*]

Santal Bowne.—A quantity of this product alleged to have been shipped by the General Drug Co., New York City, in November, 1916, was declared misbranded by the federal authorities. Analysis of a sample of the article by the Bureau of Chemistry showed it to consist of capsules containing oils of santal and cassia. The preparation was declared misbranded because there were statements on or in the trade package that were false and fraudulent in that they mislead the purchaser into the belief that the article could be successfully used in the treatment and cure of gonorrhea. Furthermore, the purchaser was further led to believe that the product was manufactured and packed in a foreign country when in fact it was manufactured and packed in the United States. In December, 1919, judgment of condemnation and forfeiture was entered and the court ordered that the product be destroyed.—[*Notice of Judgment No. 8752; issued May 13, 1921.*]

Lallemand's Rheumatism, Gout and Neuralgia Treatment.—In March, 1919, the Meyer Bros. Drug Co., St. Louis, Mo., are alleged to have shipped in violation of the Food and Drugs Act a quantity of drugs labeled in part: "Lallemand's Rheumatism, Gout and Neuralgia Treatment . . . Prickly Ash Bitters Co., Sole Proprietors . . . Formerly called Lallemand's Specific." The Bureau of Chemistry analyzed a sample of the article and reported that it was a water-alcohol solution containing potassium iodid, potassium acetate and extractives from colchicum. The preparation was falsely and fraudulently represented as an effective preventive, remedy and cure for acute and chronic rheumatism, neuralgia, muscular and capsuler rheumatism and locomotor ataxia "when, in truth and in fact, it was not." In November, 1920, a plea of *nolo contendere* was entered on behalf of the Meyer Bros. Drug Co. and the company was fined $25 and costs.—[*Notice of Judgment No. 8741; issued April 27, 1921.*]

Robert J. Pierce's Empress Brand Tansy, Cotton Root, Pennyroyal and Apiol Tablets.—In April, 1920, a quantity of this product is alleged to have been shipped by the Robert J. Pierce Co., New York City. It was represented as a safe emmenagogue and a cure for suppression of the menstrual function, and was called "The Celebrated Female Regulator." Analysis of a sample by the Bureau of Chemistry showed it to consist of chocolate-coated tablets consisting of aloes, iron (ferrous) sulphate, pennyroyal, and plant extractives. The claims made for the product were declared false and fraudulent in that the article contained no ingredient or combination of ingredients capable of producing the curative therapeutic effect claimed for it. In October, 1920, judgment of condemnation and forfeiture was entered and the court ordered that the product be destroyed.—[*Notice of Judgment No. 8676; issued April 28, 1921.*]

Correspondence

WHERE IS THIS COUNTRY, ANYWAY?

To the Editor:—I recently received a "Preliminary Announcement of the Second International Congress of Eugenics" to be held in New York City in September. In a moment of leisure I casually looked over the General Committee, and, as the matter has frequently been called to my attention, I looked over the medical membership of the committee with respect to their geographic locations. The geographic distribution of the medical membership of the committee is of the sort that one frequently sees, and that is, I believe, open to criticism. Out of a membership of 103 on the General Committee, there are nineteen physicians. Of these, three are in the government service in Washington. There is one from Oregon, one from Michigan, and one from as far west as Buffalo, New York. There are thirteen other medical men on the committee, all of whom are located on the Atlantic Coast north of the Potomac River. Three of them are Johns Hopkins professors, and a fourth is a transplanted Johns Hopkins professor; none of them being notable, as far as the writer knows, for his prominence in eugenics. In other words, 25 per cent. (excluding the government representatives, who are all from Washington) of the membership of this "International" Committee is from Johns Hopkins. Over 50 per cent. is allowed for the rest of the Atlantic Coast, and less than 20 per cent. for the United States not including the Atlantic Coast. It is not a grateful matter to raise these questions, but one hears comment on them so frequently in private that the writer ventures to emerge into print and call attention to them. Johns Hopkins is a good place; but does it constitute 25 per cent. of the representation of the United States in medicine? Are they not too fond of themselves in things of this sort? Everybody knows how committees of this kind are made up: One man, or a few men, pick out the men that occur to them as suitable. But in an "International" committee would it not be worth while to give the matter a little thought and select the committee with some regard for actual representation? Is it proper or representative to select the entire committee of an "International" congress from the Atlantic Coast? In addition to Eugene, Ore., Buffalo and Battle Creek, there are several places in the United States outside of the eastern fringe of Massachusetts, New York, New Jersey and Maryland, and there are some representative medical men in them. I do not know many specialists in eugenics in these outlying districts, but no more do I find many men, whose work in that field is known to me, included

in this general committee. But the geographic distribution of this particular committee is taken merely as an illustration of the membership of many similar bodies; otherwise it would not be worth while to call attention to the matter. Of course the members of such a committee are always so many bellwethers; but if you want the flock to follow, would it not be a good plan to select bellwethers who are representative of the whole country?

W. A. Pusey, M.D., Chicago.

CANCER OF THE TONGUE A PREVENTABLE DISEASE

To the Editor:—We all know that the chimney-sweep cancer of the scrotum has disappeared since the human being no longer accompanies the sweep down and up the chimney. This cancer of the skin of the scrotum was due to long and continued irritation by dirt.

In a recent reinvestigation of 260 cases of cancer of the tongue, the evidence seems convincing that this cancer is due to long and continuous chronic irritation by tobacco, by repeated burns from smoking, by continuous irritation, or direct wounds of dirty, rough teeth, or improperly fitted plates. In carefully taken histories there is hardly a record of a cancer of the tongue in an individual who has not been warned by definite local lesions which were not cancer and which have been present months, and usually years, before the development of cancer.

There is every evidence to conclude that if this information is widely and correctly disseminated, and the public, the medical and dental profession realize that cancer of the tongue is a preventable disease, death from cancer should largely disappear.

My experience with the operative treatment of cancer of the tongue in its early stage shows only 62 per cent. of five-year cures and only 12 per cent. of five-year cures after the most extensive radical removal of advanced cancer. During a period of thirty-two years (1889 to 1921) there have been 14 per cent. (thirty-six cases) of early cancer of the tongue, with 62 per cent. five-year cures; 28 per cent. (seventy-five cases) of advanced or late cancer of the tongue, with 12 per cent. five-year cures; and 18 per cent. of inoperable cancers of the tongue with no cures.

This study, which has been carried on continuously since 1910, leads me to the conclusion that more lives can be saved by the education of the public and the medical and dental professions on the causes and prevention of cancer of the tongue, than by any improvement in surgical technic, or any combination of treatment with the knife, cautery, radium or roentgen rays, for cancer of the tongue.

In my own sphere of educational influence, the propaganda of teaching has increased the number of benign precancerous lesions from 3 per cent. in the first decade (up to 1900) to 48 per cent. in the third decade (1910-1920); and so far in the beginning of the fourth decade (1920-1921) the percentage of benign lesions is 55. There is every reason to believe that these 105 men who have come under observation, entirely as the result of educational propaganda, have been largely protected from cancer. The cause of their local lesion has been removed, and they have been informed on the details of oral hygiene for their future protection.

During the same period the percentage of early cancer has increased from 3 to 23; advanced cancer has decreased from 48 to 11 per cent., and hopeless cancer from 44 to 11 per cent.

Cancer of the tongue is a disease of men who smoke in excess and carelessly, or who chew tobacco constantly and, in addition, neglect the teeth.

The most common warning is leukoplakia, single, multiple patches, or diffuse white patches in the mouth. The individual is always aware of them, usually for years before cancer develops. The treatment is to remove the cause. The use of tobacco in all forms should cease at once, and the teeth should be put and kept in perfect order. It may require three or four years for the leukoplakia to disappear.

The second most common warning is a local area of irritation adjoining ragged, dirty teeth. Tobacco should be discontinued, and the teeth put and kept in perfect order.

Syphilis as an etiologic factor has been exaggerated. If there is a history of syphilis and a positive Wassermann reaction, specific treatment should be promptly administered; but subsequent development of cancer will not be prevented by this treatment alone. The causes—tobacco and dirty, rough teeth—must be eliminated at once.

Local treatment of leukoplakia or of the area of irritation by radium, roentgen or any irritating caustic is contraindicated. The cause must be removed first; then, if the local lesion, except leukoplakia, does not rapidly disappear, it should be excised with a good margin of healthy tissue with the cautery. Do not excise a piece for diagnosis. Remove the area with such a good margin of healthy tissue that, if the microscope reveals early carcinoma, there will be no indication for further local operation.

The prevention of death from cancer of the tongue depends on these simple instructions in oral hygiene.

Joseph C. Bloodgood, M.D., Baltimore.

CHIROPRACTIC, NOT A NUXATED, VICTORY

To the Editor:—On page 130 of The Journal, July 9 issue, I note that you give Nuxated Iron credit for Dempsey's victory. I feel that I should inform you that you are absolutely wrong and inform you that the Des Moines *Register* recently gave a half column to the statement that Dempsey's victory was due mostly to the efforts of a chiropractor who was on his training staff and who was placed there by a certain Dr. Palmer of Davenport. I hope you will give credit where it is due.

Charles L. Jones, M.D., Gilmore City, Va.

Queries and Minor Notes

Anonymous Communications and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

COLLOIDAL GOLD SOLUTION

To the Editor:—Some time ago you gave a description of Lange's colloidal gold test, but not the method of preparing the "solution." Can you give me the latter information?

F. H., M.D., Oregon.

Answer.—According to a recent publication of Gettler and Jackson (*Arch. Neurol. & Psychiat.* 6:71 [July] 1921) a satisfactory colloidal gold "solution" can be thus prepared:

Into a clean 1.5 liter Florence flask place 1 liter of specially distilled water. (For preparation of the water: to 10 liters of water in a large copper still, add a few crystals of potassium permanganate and distil, rejecting first 300 c.c.) To this add 10 c.c. of 1 per cent. gold chlorid solution, 7 c.c. of 2 per cent. potassium carbonate solution and 0.5 c.c. of 1 per cent. oxalic acid solution. Heat this mixture to the boiling point, and at this temperature remove the flask from the flame, holding it by means of a towel, and shake the contents vigorously. While the solution is still in motion, add quickly from 0.2 to 0.3 c.c. of formaldehyd Solution U. S. P. and at once shake the flask and contents thoroughly for from one-half to one minute. After from three to four minutes the color usually commences to develop. If, however, there should be no indication of color, the solution must again be shaken well and, while still in motion, an additional 0.1 to 0.2 c.c. of Formaldehyd solution quickly added; this addition almost invariably produces the desired change. At no time during this process should the agitation be stopped. The color should develop rapidly to a deep red. If, however, there is a delay in the appearance of color, the mixture should be allowed to stand, and in a minute or two the color will start to develop; at this instant the solution should again be thoroughly shaken until the color reaches a deep red shade. The entire process, from the moment the solution reaches the boiling point until the color is fully developed, requires at the most about three minutes.

Medical Education, Registration and Hospital Service

COMING EXAMINATIONS

MARYLAND: Baltimore, July 19. Sec., Regular Board, Dr. J. McP. Scott, 141 W. Washington St., Hagerstown.

SOUTH DAKOTA: Deadwood, July 19-20. Director of Medical Licensure, Dr. H. R. Kenaston, Bonesteel.

California February Examination

Dr. Charles B. Pinkham, secretary, California State Board of Medical Examiners, reports the oral and written examination held at Los Angeles, Feb. 14-17, 1921. The examination covered 9 subjects and included 90 questions. An average of 75 per cent. was required to pass. Of the 72 candidates who took the physician's and surgeon's examination, 37, including 10 osteopaths, passed, and 35, including 3 osteopaths, failed. Two candidates failed to receive osteopathic licenses. One hundred and thirty-three candidates were licensed by reciprocity. Three candidates were licensed on government credentials. Of the 8 candidates who took the examination for drugless practitioners, 5 passed and 3 failed. One candidate passed the test of competency and received a certificate to practice as a practitioner. Ten candidates received osteopathic certificates by reciprocity. Two candidates were licensed to practice chiropody. The following colleges were represented:

College	Year Grad.	Per Cent.
PASSED		
College of Physicians and Surgeons, Los Angeles	(1920)	78.5
College of Physicians and Surgeons, San Francisco	(1920)	80.5
Leland Stanford Junior University	(1920) 87.1, (1921)	88.7
Yale University School of Medicine	(1913)	83.5
George Washington University	(1920)	85.3
Rush Medical College	(1917) 87.1, (1919) 88.1, (1920) 88.2, 90.6, 95.3	85.3,
University of Illinois	(1920)	86
Harvard University	(1920)	89
University of Michigan Medical School	(1904)	75
University of Minnesota Medical School	(1920)	86.8
Columbia University	(1919) 88.5, (1920)	77.1
University of Oregon	(1920)	76
University of Pennsylvania	(1918)	87.5
University of Manitoba	(1913)	90.3
University of Toronto	(1910)	90.9
McGill University	(1897) 86.2, (1900) 81.7, (1919)	83.5
Tokyo Charity Hospital Special Medical School	(1914)*	75.1
University of Leyden	(1898)*	84
FAILED		
College of Physicians and Surgeons, Los Angeles	(1920)	68.9
College of Physicians and Surgeons, San Francisco	(1918)	65.6
Chicago Homeopathic Medical College	(1889)	67
Chicago Physio-Medical College	(1896)	24
College of Physicians and Surgeons, Chicago	(1892)	60
Hahnemann Med. Coll. and Hosp., Chicago	(1892) 64, (1899) 46	
Rush Medical College	(1900) 60, (1902)	55
Sioux City College of Medicine	(1896)	54
Kentucky School of Medicine	(1886)	56
Hospital College of Medicine, Louisville	(1898)	51
University of Louisville	(1895) 64, (1898)	42
Baltimore Medical College	(1895)	55
College of Physicians and Surgeons	(1897)	64
Grand Rapids Medical College	(1901)	69
Minneapolis College of Phys. and Surg	(1899) 71, (1900)	59
Kansas City Medical College	(1881)	50
St. Louis College of Physicians and Surgeons	(1888)	50
Eclectic Medical College of the City of New York	(1896)	64
Eclectic Medical Institute, Cincinnati	(1875)	60
Starling Medical College	(1891) 69, (1895)	35
Jefferson Medical College	(1891)	64
Nashville Medical College	(1901)	30
University of Nashville	(1897)	44
College of Physicians and Surgeons, Dallas	(1905)	66
Milwaukee Medical College	(1895)	65
University of Berlin	(1882)*	69
University of Palermo	(1913)*	62.9

College	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
California Eclectic Medical College		(1914)	Washington
College of Phys. and Surg., San Francisco		(1918, 2)	Nevada
Cooper Medical College		(1902)	Nevada
Denver and Gross College of Medicine		(1909)	Colorado
Gross Medical College		(1902)	Utah
Georgetown University School of Medicine		(1907)	Arizona
American College of Medicine and Surgery		(1904)	Illinois
Chicago College of Medicine and Surgery	(1910, 2) Illinois, (1911) South Dakota, (1913, 2) Illinois, (1915) Illinois, (1917) Illinois.		Illinois
Chicago Homeopathic Medical College		(1899)	Illinois
College of Physicians and Surgeons, Chicago	(1901) Washington, (1903, 2) Illinois, (1905) Illinois	(1889)	Iowa
Loyola University		(1917)	Utah
National Medical University, Chicago	(1902) New Mexico	(1899)	Wisconsin
Northwestern University	(1902) Wisconsin, (1904) Illinois, (1905) Illinois, (1906) Illinois	(1881) Iowa, (1901)	Idaho
Rush Medical College	Kansas, (1894) Indiana, (1897) Illinois, (1899) Minnesota, Iowa, (1901) Minnesota, (1902) South Dakota, (1903) Illinois, (1914) Minnesota, (1915) Illinois, (1917) Illinois, Nebraska	(1886) Illinois, (1893)	Illinois
University of Illinois		(1919)	Illinois
Indiana University School of Medicine	(1910) Indiana	(1908)	Indiana
Drake University	(1913) Missouri	(1906) Iowa, (1907) Iowa, (1908)	Iowa
Keokuk Medical College		(1893) New York, (1898)	Washington
State University of Iowa College of Medicine		(1896), (1904), (1905), (1906), (1915)	Iowa
State University of Iowa College of Homeopathic Medicine		(1894) Iowa, (1903)	Indiana
College of Physicians and Surgeons, Kansas City		(1898)	Illinois
University of Louisville	(1910) Colorado, (1912) Iowa	(1889) Kentucky, (1898)	Texas
Tulane University		(1907)	Tennessee
Baltimore Medical College		(1893) Indiana, (1906)	Arizona
College of Physicians and Surgeons, Baltimore		(1904)	Arizona
Johns Hopkins University		(1912)	Illinois
Maryland Medical College		(1909)	Penna.
University of Maryland		(1900) Missouri, (1906)	Indiana
Boston University School of Medicine		(1902)	Mass.
Harvard University		(1915)	Connecticut
Tufts College Medical School		(1905), (1907, 2)	Mass.
Detroit College of Medicine and Surgery			Iowa
Minneapolis College of Physicians and Surgeons	(1906) Minnesota	(1900)	Montana
Univ. of Minnesota Med. School		(1900) Montana, (1906)	Washington
Barnes Medical College		(1898)	Missouri
Ensworth Medical College		(1897) Missouri, (1907)	Iowa
Kansas City Medical College		(1903) Utah, (1905)	Missouri
Marion-Sims College of Medicine		(1899)	Illinois
Missouri Medical College	(1889) New York	(1881), (1893)	Missouri
St. Louis University School of Medicine		(1908)	Missouri
University Medical College of Kansas City	(1909) Missouri	(1906)	Kansas
University of Missouri		(1898)	Missouri
Washington University		(1903)	Iowa
John A. Creighton Medical College		(1907)	Nebraska
Lincoln Medical College		(1901)	Kansas
Albany Medical College		(1914)	New York
Cornell University Medical College		(1910)	New York
Fordham University		(1917)	New York
Woman's Medical College of the New York Infirmary for Women and Children		(1898)	Mass.
Syracuse University		(1896)	New York
University of Wooster Medical Department		(1881)	New York
Western Reserve University		(1897)	Ohio
Jefferson Medical College	(1910) Idaho	(1883) Nebraska, (1907)	Montana
University of Pennsylvania	(1899) Utah, 1901, 2) Pennsylvania, (1902) Iowa, (1903) Illinois	(1887) Iowa, (1890)	Illinois
Western Pennsylvania Medical College		(1905)	Penna.
Medical College of the State of South Carolina		(1917)	Florida
Meharry Medical College		(1907) Oklahoma, (1909)	Tennessee
Vanderbilt University Medical Department		(1912)	New York
Baylor University		(1916)	Texas
Fort Worth School of Medicine		(1914), (1916)	Texas
University of Vermont		(1900)	Vermont
University College of Medicine, Richmond		(1903), (1907)	Virginia
Milwaukee Medical College		(1905)	Wisconsin
Wisconsin College of Physicians and Surgeons		(1912)	Wisconsin
University of Bishop College		(1903)	Wisconsin
University of Manitoba		(1893)	Illinois
Montreal School of Medicine and Surgery		(1889)	Mass.
University of Munich		(1912)	Wyoming

College	ENDORSEMENT OF CREDENTIALS	Year Grad.	Endorsement with
George Washington University		(1913)	U. S. Army
Washington University		(1909)	U. S. Army
Medical College of Ohio		(1884)	U. S. Army

* Graduation not verified.

Maine March Examination

Dr. Frank W. Searle, secretary, Maine State Board of Registration in Medicine, reports the written examination held at Portland, March 8-9, 1921. The examination covered 10 subjects and included 100 questions. An average of 75 per cent. was required to pass. Of the 10 candidates examined, 8 passed and 2 failed. One candidate was licensed by reciprocity. The following colleges were represented:

College	Year Grad.	Per Cent.
PASSED		
Boston University School of Medicine	(1920)	81
Tufts College Medical School	(1920)	82
Temple University Department of Medicine	(1919)	79
University of Pennsylvania	(1919)	81
Laval University Faculty of Medicine	(1919)	80
McGill University Faculty of Medicine	(1916)	83
University of Montreal Faculty of Medicine	(1919)	79
Royal University of Hungary	(1917)*	75
FAILED		
Hahnemann Med. College and Hosp. of Philadelphia	(1915)†	75
University of Montreal Faculty of Medicine	(1920)†	79

College	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
University of Maryland		(1917)	Penna.

* Graduation not verified.
† Fell below 60 per cent. in anatomy.

Book Notices

Diagnosis and Treatment of Brain Injuries with and without a Fracture of the Skull. By William Sharpe, M.D., Professor of Neurologic Surgery, New York Polyclinic Medical School and Hospital. Cloth. Price, $8. Pp. 757, with 232 illustrations. Philadelphia: J. B. Lippincott Company, 1920.

The author presents, in detail, reports of a large number of individual cases rather completely worked up, including careful data on the progression of the changes in the eye-grounds and in spinal fluid findings (the pressure variations accurately measured by the spinal mercury manometer), post-operative notes, and examinations made repeatedly for months and even years after the patient has left the hospital, in the belief that such a record of end-results will be of service to the general practitioner and the general surgeon. He has confined himself to two general groups of cases: acute and chronic brain injuries in adults, and acute and chronic brain injuries in the new-born and in children. The latter group, he believes, presents a series of pathologic pictures and clinical problems which have been so frequently overlooked and even neglected that the reporting in detail of a large number of cases is of especial value to the obstetrician and the pediatrician. In considering the indications for operation in acute intracranial injuries in adults, the relative unimportance of whether a fracture of the skull is present or not is continually emphasized. In selecting cases for decompression, he differentiates sharply between the clinical expressions of intracranial pressure before and after the advent of the stage of medullary compression and the ensuing edema and collapse—the two periods in which intervention to relieve pressure is distinctly contraindicated, one described as those of the primary shock, and one as those of the stages of medullary compression and edema. The most trustworthy criterion of an increase in the intracranial pressure while decompression is still justified are the progression of the eye-ground changes and a marked increase in cerebrospinal fluid pressure as revealed by lumbar puncture. He believes that the operative indications are the same whether the pressure increase is due to hemorrhage or to edema. An interesting study is attempted of the end-results in patients having brain injuries in whom either no surgical intervention was instituted or intracranial pressure was not relieved because of a faulty type of operation or of failure to open the dura. He finds that even several years after discharge from hospital care, 67 per cent. of such cases present major symptoms attributable to the results of the injuries.

Methodik der Blutuntersuchung, mit einem Anhang: Zytodiagnostische Technik. Von Dr. A. v. Domarus, Direktor der Inneren Abteilung des Auguste Victoria-Krankenhauses, Berlin-Weissensee. Paper. Price, 58 marks. Pp. 489, with 197 illustrations. Berlin: Julius Springer, 1921.

This work forms part of the "Enzylopaedie der Klinischen Medizin" edited by Langstein, von Noorden, Pirquet and Schittenhelm. It is a comprehensive treatise on the various methods of blood examination, including among other subjects the various methods of estimating hemoglobin; methods for counting the different cellular elements; estimation of the amount of blood; viscosity of blood; determination of coagulation time of the blood; resistance of the red cells; estimation of the volume of the cells and the serum; determination of the dry residue of the blood; estimation of the amount of protein bodies; determination of the freezing point and the electric conductivity; estimation of the reaction of the blood and the hydrogen-ion concentration of the blood; an extensive discussion of the morphologic examination of the blood by means of native and stained preparations; examination of the hematopoietic organs, and methods for general cytodiagnosis. No attention, however, is paid to the newer phases of blood chemistry, which are assuming so much importance in clinical medicine. While much space is devoted to a discussion of the electrometric methods of determining the H-ion concentration of the blood, no mention is made of the clinically important indicator methods, which have been so fully elaborated by our own American workers. The text is clear, the illustrations are adequate, and the methods discussed are those that are well recognized and have stood the test of time. In the discussion of these methods, special attention is paid to matters of technic, and the various pitfalls are pointed out into which the worker may fall in following the method and interpreting his results. A rather extensive bibliography at the end of the book gives it increased value as a work of reference. This work should find a place in reference libraries, and is especially recommended to those workers in clinical or hospital laboratories who have frequent occasion to look up some method outside their daily routine.

Rational Treatment of Pulmonary Tuberculosis. By Charles Sabourin, M.D., Medical Director of the Durtol Sanatorium, Puyde Dôme, France. Sixth edition. Cloth. Price, $3.50 net. Pp. 440. Philadelphia: F. A. Davis Company, 1921.

This book contains so much "orthodox" matter and so much that is open to criticism that it is difficult to classify. In addition, it seems unnecessarily prolix. The author aims to provide a therapeutic guide to the treatment of tuberculosis. Here he treads on debatable ground. It is evident that he is possessed of large experience in the care of the tuberculous. It is likely, however, that the American student of tuberculosis will object to many recommendations made by the author. For instance, he may take exception to the chapter which devotes much space to the consideration of creosote, cod's oil, phosphorus and tannin, while the rather loose rest treatment will likewise call forth his objections. The statement (p. 96) that the author "is convinced of the uselessness of immobilizing in bed, patients who are afebrile in the morning hours, even though they have pronounced fever in the afternoon" will certainly call forth criticism. It is startling to read that, for cough, the patient is permitted to carry with him a box of opium pills (p. 227). One doubts whether the American practitioner will follow the author's advice to treat hemorrhage by the "administration of ipecac in emetic doses." The author is director of a French sanatorium which, we take it, cares for the well-to-do; and it is evident that he has had his troubles in dealing with intractable patients. He goes into some rather illuminating details in this connection. It is to be regretted that the many sound statements are somewhat beclouded by less reliable matter. The book is worth reading by those who are well grounded in their knowledge of tuberculosis.

Graphic Methods in Heart Disease. By John Hay, M.D., F.R.C.P., with an Introduction by Sir James Mackenzie, M.D., F.R.C.P. Cloth Price, $5.00. Pp. 178, with 176 illustrations. New York: Oxford University Press, 1921.

Since 1909, when Hay first published his small volume on Graphic Methods in Heart Disease, much has been learned of the mechanism of the normal and abnormal heart beat. These additions to our knowledge are critically incorporated into this second edition. The book in reality is concerned almost exclusively with the discussion of the polygraph and its application in clinical medicine. We are familiar with no clearer, more satisfying treatment of this topic than Hay. While the electrocardiograph has largely displaced the polygraph as an instrument of precision in investigative work and in the hospital, the latter instrument, because of its smaller cost and its portability may still be regarded as of practical value and not merely of historical interest. Hay's book is, therefore, far from out of date. He has added a condensed chapter on the electrocardiograph, with good illustrative tracings. In fact all of the illustrations are excellent and helpful.

Psychology and Psychotherapy. By William Brown, M.A., M.D., D.Sc., Reader in Psychology in the University of London (King's College). With a Foreword by William Aldren Turner, C.B., M.D. Cloth. Price, $3. Pp. 196. New York: Longmans, Green & Co., 1921.

This is the latest and one of the best of books on the subject published in England since the war. Like the others it is a product of war experience, and like the others it shows evidence of immaturity; but it also shows evidence of honest, earnest effort. To see an author approach his subject with an open mind and without prejudice is always refreshing, and is generally profitable for the reader. The psychology of Dr. Brown's book is the psychology forced upon him by an extensive and varied experience with the psychoneuroses of war, and the psychotherapy is such as he found useful. Not

that he ignores the work of others. He has consulted practically all schools, gives a very good summary of their ideas, and makes a consistent attempt to be eclectic. To the psychanalysts he gives more than one third of the book, and considerable credit; but is far from being a Freudian. He unreservedly endorses Janet's teaching on dissociation, and he believes in the usefulness of free association; but he uses hypnotism a lot, and is convinced of the efficacy of *Abreaction* or psychocatharsis. For old and refractory cases, however, he recommends the persuasion method of Dubois, calling it autognosis. That is, he strives to give the patient insight into his condition. The digest of the subject is good, the cases are interesting and instructive, and the advice is reasonable. A few of the statements are a bit absurd, and a few others must be taken with a grain of salt; but the book will be very useful for any practitioner interested in the subject—and every practitioner should be.

NOTIONS PRATIQUES D'ÉLECTROTHÉRAPIE APPLIQUÉE A L'UROLOGIE. Par le Docteur Denis Courtade, Chef de Laboratoire à la Faculté de Médecine. Préface de Monsieur le Professeur Legueu. Second edition. Paper. Price, 18 francs. Pp. 244. Paris: E. Le François, 1921.

In this treatise galvanic and faradic currents and static electricity are defined, and the modern conceptions of this form of energy are thoroughly elucidated. Then follows a dissertation on high frequency currents. This division, dealing with the physics of electricity, seems to be the best part of the book. Less praise is due the therapeutic chapters. There is hardly a pathologic condition of the genito-urinary tract for the treatment of which electrotherapy of some form is not here recommended and explained. If the results obtained by the author keep step with his enthusiasm, which is certainly not shared by the majority of American urologists, he is accomplishing more than any one of his confrères. Neuralgias of the urinary tract and functional disorders all are the subject of electric treatment. Pollakiuria, nocturnal enuresis and spermatorrhea form, in the author's opinion, also grateful fields for electric treatment. Even cystitis is treated by electricity, the author recommending the obsolete method of trying to force medicated solutions into the vesical wall by means of the electric current. Electrolysis, so long discarded, is again suggested for the treatment of urethral strictures. The most important branch of electrotherapy in urologic surgery—fulguration and electrocoagulation of vesical tumors—is only scantily dealt with, and instructive illustrations illuminating this interference, now practiced everywhere, are missing.

SYPHILIS UND NERVENSYSTEM. Ein Handbuch in zwanzig Vorlesungen für praktische Aerzte, Neurologen und Syphilidologen. Von Dr. Max Nonne, Oberarzt am Allgemeinen Krankenhaus Hamburg-Eppendorf. Fourth edition. Paper. Price, 360 marks. Pp. 1019, with 169 illustrations. Berlin: S. Karger, 1921.

The fourth and enlarged edition of this standard and authoritative work retains the form of twenty clinical lectures, each of which, however, has been expanded into a comprehensive monograph. While essentially using his own huge material as a base, the author refers also extensively and impartially to the literature of many lands. It is the most complete work dealing with the pathology, symptomatology and diagnosis of the syphilitic diseases of the nervous system. Only one lecture of eighty pages is given to prophylaxis and treatment. As regards the latter, the author goes into less detail and is more noncommittal than his colleague, Professor Gennerich of Kiel, whose monograph on the same subject was recently reviewed in THE JOURNAL (May 28, p. 1522).

EYE, EAR, NOSE AND THROAT NURSING. By A. Edward Davis, A.M., M.D., Professor of Diseases of the Eye in the New York Post-Graduate Medical School and Hospital, and Beaman Douglass, M.D., Professor of Diseases of the Nose and Throat in the New York Post-Graduate Medical School and Hospital. Second edition. Cloth. Price, $2.50 net. Pp. 346, with 32 illustrations. Philadelphia: F. A. Davis Company, 1920.

This is a second and revised edition of a very practical and useful manual for the use of nurses and students. No doubt it has been of greater use to teachers of nurses than to the nurses, for the reason that it is unnecessarily technical, especially in the chapters on the anatomy of the eye. In many ways it well illustrates the great difficulty of simplifying technical matters for the laity. Barring this fault, however, the book is to be generally commended. There are excellent chapters on contagious diseases of the eye; remedies used in ophthalmology and their application; operations on the eye and the after-nursing of surgical cases; what to do in emergency, etc. The same criticisms and the same commendations apply to that portion of the work devoted to the ear, nose and throat. The press work is excellent, but the illustrations are not clear—and an illustration which does not illustrate is valueless.

THE SOUTHERN HIGHLANDER AND HIS HOMELAND. By John C. Campbell, Secretary, Southern Highland Division, Russell Sage Foundation. Cloth. Price, $3.50 net. Pp. 405, with illustrations. New York: Russell Sage Foundation, 1921.

For twenty-five years Mr. Campbell was a resident of the region about which he writes, serving as a teacher in three different southern highland institutions. Recently he has been secretary of the division of the Russell Sage Foundation which has been making a study of the people of that district. His account is a first-hand description of the growth and development of a section of the country which is peculiarly individual. He describes a population which is as essentially American as the present descendants of the Pilgrim fathers, a population which has kept a pure stock through close intermarriage. Because of the individuality of the people discussed, the story is interesting. The anthropologic analysis, the geographic and ethnologic studies are freely interspersed with anecdote, examples of language, ballad and custom. There are numerous maps and illustrations. Appended to the work are statistical tables and an excellent bibliography.

KYSTOSKOPISCHER ATLAS. Ein Lehrbuch für Studierende und Aerzte. Von Dr. med. Erich Wossidlo. Paper. Price, 56 marks. Pp. 80, with 57 illustrations. Leipsic: Wilhelm Englemann, 1921.

This book begins with a clear exposition of the principles governing modern cystoscopy, and a description of the leading types of instruments used. Then follows a chapter dealing with the execution of this examination and a discussion of ureteral catheterization. In continuation, the entire pathology of the urinary bladder is outlined, and many useful therapeutic hints are interspersed. But most valuable are the illustrations. In thirty-four pages, each containing five or six colored plates, the author demonstrates every known pathologic picture of the interior of the bladder except bilharziasis and syphilis of this viscus. The pictures are quite true to nature. The legends explaining the pictures are concise and clear, and inserted opposite to each plate. A publication of this kind is a source of joy to the expert and a treasure to the student.

MASSAGE AND THERAPEUTIC EXERCISE. By Mary McMillan. Cloth. Price, $2.25. Pp. 274, with 72 illustrations. Philadelphia: W. B. Saunders Company, 1921.

This is a small but satisfactory introduction to mechanotherapy, with references here and there to the use of hydrotherapy and electrotherapy, without discussion, however, of the technic of the two branches of physical therapy last mentioned. The book has been written for the use of students of massage and gymnastics, and the author believes that a course, such as outlined in the book, together with practical work, might provide many a woman with an introduction into a new field of service, which may become a new profession for women as important as the nursing profession. To physicians who desire to become somewhat familiar with this form of therapy, this little book may be recommended.

LEITFADEN DER NEUROLOGISCHEN DIAGNOSTIK. Eine Differentialdiagnose aus dem führenden Symptom für praktische Aerzte und Studierende. Von Dr. Kurt Singer, Nervenarzt in Berlin, Neurologischer Fachbeirat beim Hauptversorgungsamt. Paper. Price, 45 marks. Pp. 201, with 33 illustrations. Berlin: Urban & Schwarzenberg, 1921.

This book is a compend on diagnosis, and the subject is approached from the standpoint of symptoms. The first chapter is on paralysis, the second on sensory disturbances, the third on muscular atrophy, and so it continues through eighteen chapters. The matter is quite up to the average, but many statements are extremely dogmatic. The book is fairly typical of its class, and represents another attempt at a short cut through difficult territory.

Medicolegal

One May Be an Expert Without Being a Specialist

(Brownie v. State (Neb.), 180 N. W. R. 567)

The Supreme Court of Nebraska holds that a physician in general practice, who has had experience in cases of insanity, may be entitled to testify as an expert on the question of insanity although he is not a specialist in nervous diseases and testifies that he is not an expert on insanity. The court says that in this homicide case, wherein the defendant pleaded insanity, one physician, called by the state, testified that he was a graduate of a regular medical school, had been licensed to practice, and had been engaged in regular practice for thirty-four years; that he had had experience in insanity cases and was, in fact, serving as medical examiner on the county insanity board; but he stated that he was not an expert on insanity matters. This witness, over the defendant's objection as to his qualifications, was allowed to give expert testimony on the question of the defendant's sanity. Such testimony was not improperly received. It is the function of the court to determine the qualifications of a witness, offered as an expert, from the showing of fact as to the study made and knowledge acquired by the witness on the particular matter in question. The conclusion of a witness as to whether or not he is an expert is not binding on the court. It is apparent, in this case, that what the witness intended to convey by his assertion that he was not an expert was that he was not a specialist in matters of insanity. It was, however, not necessary that he be a specialist. If it appears to the court that the witness has had an opportunity to make special study and has done so, and has thus acquired knowledge and has had experience in reference to the matter beyond that of ordinary persons, he may be allowed to testify as an expert. The extent, then, of such knowledge and experience, bears on the weight to be given to his testimony by the jury.

Murder or Manslaughter in Death from Abortion

(Lee v. State (Miss.), 86 So. R. 856)

The Supreme Court of Mississippi, Division A, in affirming a conviction of manslaughter, says that the indictment was in the language of Section 1431 of the Code of 1906, and alleged simply that defendant Lee "did feloniously kill and slay the deceased," describing her by name. The death of the woman was caused by a surgical operation performed on her for the purpose of producing an abortion. The jury was warranted in believing from the evidence that the operation was performed by the defendant, a physician and surgeon, with the woman's consent for the purpose of relieving her of a fetus which had not become quick. No necessity for relieving her of the fetus was shown or claimed. The defendant's conviction must, of course, rest either on a statute of the state or on the common law, and the defendant contended that it could rest only on Section 1232 or Section 1233 of the Code of 1906, which provide that "the killing of a human being without malice, by an act, procurement, or culpable negligence of another, while such other is engaged in the perpetration of" any misdemeanor or certain felonies, is manslaughter; and that it did not come within the terms of either for the reason that producing an abortion with the woman's consent before the fetus had become quick was not a crime either at common law or under any statute of the state of Mississippi. But while it was true that the production of such an abortion is not prohibited by any statute of Mississippi and the authorities are in conflict as to whether or not it is a crime at common law, the defendant's guilt did not depend on either of these statutes, or on the criminality of such an operation, for under all the authorities if an abortion results in the death of the woman it is, at common law, either murder or manslaughter without reference to the state of the fetus or the criminality of the abortion itself, for the reason that producing an abortion is a deliberate act, dangerous to life and involving great bodily harm. If the act by which an abortion resulting in the death of the woman is produced is eminently dangerous to, and evinces a depraved heart regardless of human life, the crime committed will be murder under the provisions of Section 1227 of the code; but if it does not evince a depraved heart regardless of human life, the crime committed will be manslaughter under Section 1244, which provides that "every other killing of a human being, by the act, procurement, or culpable negligence of another, and without authority of law, not provided for in this chapter, shall be manslaughter." The crime here under consideration came within the second of these classes. No witness testified to having seen the defendant perform the operation, and he himself denied having performed it; but the verdict of the jury was on the evidence clearly right. In short, the court holds that a person producing an abortion solely for the purpose of relieving the woman of the child which results in her death, though produced with her consent, is guilty of either murder or manslaughter, regardless of whether the child with which the woman was pregnant was quick; of "murder," under Section 1227 of the code, if the act by which the abortion was produced is eminently dangerous to, or evinces a depraved heart regardless of, human life; "manslaughter," under Section 1244, if the act by which the abortion was produced is not eminently dangerous to, and does not evince a depraved heart, regardless of human life.

Time Limit to Beginning Actions for Malpractice

(Ericson v. Charles (Kan.), 194 Pac. R. 652)

The Supreme Court of Kansas says that in one count the plaintiff alleged, in substance, that the defendant agreed to perform an operation on her in order to relieve her from an obstruction of the bowels, and to give her the necessary treatment following the operation, for $100, and it was also agreed that he would not remove her vermiform appendix, uterus and ovaries, or perform any other operation on them, but that, when she submitted to the operation, in violation of his agreement he removed the appendix, and stitched the uterus to the walls of the abdomen in a manner not in accordance with the custom and practice of good and prudent surgeons, causing her to suffer great injury and pain, for which she asked judgment in the sum of $5,468.44. In a second count the plaintiff set out the facts substantially as in the first, except that no mention was made of an employment or of an agreement as to the manner or extent of the operation; but it was alleged that the defendant, in disregard of his obligation and duties as a surgeon to perform the operation in a manner becoming a good, reputable and ordinarily prudent surgeon, had removed the appendix, which was in a good, healthy condition, and had stitched the uterus to the wall of the abdomen, contrary to the custom and practice followed by good surgeons; and, further, that the operation on the obstruction of the bowels, the ailment for which the plaintiff underwent the operation, was not properly done and afforded only partial relief. Following this were the same allegations as to the pain, mental anguish and injury which resulted from the operation as performed, with prayer for judgment, as in the first count. The action was brought more than two years after the cause of action accrued, but less than three years after that time. A demurrer to the first count was overruled on the theory that the cause of action alleged was one arising on contract, to which the three-year statute of limitations of Kansas applied. But what was treated as a demurrer to the second count was sustained on the ground that that count stated a cause of action sounding in tort and was barred by the two-year statute of limitations. The plaintiff insisted that when the defendant undertook to perform the operation an implied obligation arose on his part that he would use reasonable skill and care in its performance, and on her part that she would pay him the reasonable value of his services. She therefore contended that she was entitled to, and in her pleading did, waive the tort and sue on what she called the implied contract in the transaction. But there was no averment in the second count of an agreement between the plaintiff and the defendant, nor even of employment. It was alleged in effect that he performed the operation, but that it was negligently and unskilfully done. In this count, the

plaintiff set up no more than the violation of duty and the wrong of the defendant. It is true that in certain cases wherein the defendant derives a benefit from a tortious act the plaintiff may waive the tort and sue on the implied contract of the defendant to pay for property taken or benefit derived by him. Here, however, the averments in the count were those stated in an ordinary petition for malpractice and were such as to characterize it as an action ex delicto, or for a wrongful act. Having pleaded an express contract in the first count, the plaintiff was hardly in a position to plead a contract implied by law, as the existence of an express agreement precludes the idea of the existence of an implied one. In other words, an action for malpractice in which is alleged in substance that the defendant, in disregard of his obligations as a surgeon, performed an operation on the plaintiff in a negligent manner, and not in accordance with the custom and practice followed by good, reputable and prudent surgeons, with a result that the plaintiff suffered great pain and injury, for which she asks damages, is one arising on tort, and not on contract, and the statutory limitation of two years applies to such action.

Society Proceedings

COMING MEETINGS

American Electro-Therapeutic Association, Washington, D. C., Sept. 7-10.
Delaware State Medical Society, Rehoboth, Aug. 16.
Colorado Congress of Ophthalmology and Oto-Laryngology, Denver, July 29-30.
Colorado State Medical Society, Pueblo, Sept. 6-8.
Minnesota State Medical Association, Duluth, Aug. 24-26.
Wisconsin, State Medical Society of, Milwaukee, Sept. 7-9.

AMERICAN PEDIATRIC SOCIETY

Thirty-Third Annual Meeting, held in Swampscott, Mass., June 2-4, 1921

The President, Dr. JOHN HOWLAND, Baltimore, in the Chair

Prolonged Intolerance to Carbohydrates

Dr. JOHN HOWLAND, Baltimore: In cases of prolonged intolerance to carbohydrates which perpetuates diarrhea it is apparently the sugar and not the fat that is responsible. The first indication in treatment is to reduce the sugar to its lowest limits in a food which furnishes the other requirements for adequate nutrition. Nothing can compare with protein milk in this respect. It allows the presence of fat, protein and salts with a minimum of disturbing sugar, and it furnishes the substances necessary for the formation of insoluble soaps. Carbohydrates must be withheld for a long time. A polysaccharid, such as farina, is not only at times well borne but may even have a marked constipating effect. Young infants will not usually tolerate this, but in the case of older infants it may be strikingly successful. In another condition, commonly known as chronic indigestion or intestinal infantilism of Herter, it has been found that of all the elements of food, carbohydrate is the one that must be excluded most rigorously. In this class of cases the diet may consist of (1) protein milk alone, continued until the stools are firm, distention is very slight, gas is not in excess, and the appetite is good; (2) protein milk as a basis reinforced by almost pure protein foods, such as curds without whey, scraped meat, certain forms of cheese, egg white and eventually whole egg. The duration of this stage may be many months, even years. This is not an ideal diet, but it is an adequate diet. (3) Carbohydrates added gradually. Bread, potato and cereals are the last articles that can be allowed.

Blood Studies in the New-Born

Drs. W. P. LUCAS, B. F. DEARING, H. R. HOOBLER, et al., San Francisco: The blood obtained a few hours after birth to the fourteenth day postpartum was studied in 150 infants. The hemoglobin was high at birth, that of the sinus blood tending to be higher than that of the peripheral blood. The red blood cells were high during the first week and then gradually decreased, corresponding closely with the decrease in hemoglobin. The same leukocytosis was observed as has been noted by other observers, though it was by no means constant. The leukocytosis during the first week was definitely due to the polymorphonuclears; this continued to be so until the seventh day, when the polymorphonuclears gradually declined, reaching the same level as the lymphocytes on this day. The lymphocytes gradually increased and were still increasing at the close of these observations on the twelfth day. There was slight increase in the transitional cells which, toward the end of the period of observation, decreased slightly. The same was true of the eosinophils. These counts in the sinus blood again showed a slight increase over those of the peripheral blood. The platelet count during the first eight days corresponded very nearly to those of Dr. Mary E. Morse. During the period of prolonged coagulation time the serum bilirubin curve was also increased, but it did not seem to affect the coagulation time in cases of marked jaundice. During the time that the coagulation time was prolonged, the prothrombin factor was definitely diminished. After the fourth day the prothrombin factor apparently reached normal levels, though it might be delayed several days longer. The blood clot of the new-born did not seem to show any defect in retractility of the clot, and there was no fibrinolysis. This was exactly the condition that existed in hemophilia. One might conclude, that the factor involved in the ordinary case of hemorrhage in the new-born was a diminution in the prothrombin element, which is mainly derived from the platelets. We have not been able to show urobilin in the stools of new-born infants during the first twelve days of life, or in infants up to 10 weeks of age, although in older children it is easy to demonstrate its presence. Ninety cases were examined for bilirubin by a method which we propose, and of these seventy-two showed a positive reaction.

DISCUSSION

Dr. ALFRED F. HESS, New York: The most remarkable thing about this study is the prolonged coagulation time. In other words, these infants have latent hemophilia. These figures make us wonder that we do not get hemorrhage in the new-born more often.

Dr. FRITZ B. TALBOT, Boston: The blood sugar studies are interesting compared with the respiratory quotient. The blood sugar is low at birth and rises on the third day, and this is consistent with the respiratory quotient, which goes down immediately after birth and on the third day begins to rise. The figures for sugar in this study are low, compared with those of Folin.

Care of Premature Babies

Dr. WALTER LESTER CARR, New York: The incubator room at the Manhattan Maternity is 6½ by 7 feet, with a ceiling 12 feet high and a single door. The air intake is by a flue which passes back of a radiator. The room temperature is kept at 80 F. The incubator is an aluminum tray with a hood which does not extend the entire length of the tray but allows the baby's head to be out of the hood. Over this open end there is a curtain to protect the baby's head. In the top of the incubator are three openings for electric lights placed on elbows so as not to interfere with the clothing. One 15 watt light gives the incubator a temperature of 76 F., two lights raise the temperature to 88 F., and three lights raise it to 96 F. in forty-five minutes. A moderate temperature is better than a high one. Breast milk should be given if it can be obtained; it should be drawn from the mother or wetnurse, diluted with equal parts of 5 per cent. lactose solution and fed with a medicine dropper or a Breck feeder. Premature babies do not bar high fat. Water must be given freely. The feeding interval should be about two hours, and the amount given should not exceed 1 or 2 drams each time. Whenever possible, feeding should be done without removing the baby from the incubator. Sucrose is given to babies who have a persistently low temperature, and it apparently helps in heat production. The caloric requirements of the premature baby are high. Gavage, lavage and hypodermoclysis are sometimes employed. The administration of fluid through the longitudinal sinus is not a safe means of combating loss of weight. The average

time the incubator babies were kept in the hospital was 36.8 days. The routine was to keep the babies in the hospital until they weighed about 4 pounds. Premature babies are prone to be rachitic. Three of five babies fed on Dryco showed rickets.

DISCUSSION

Dr. H. D. Chapin, New York: In the care of premature babies two things are of importance, the temperature of the incubator and the food, and of these the food is the more important. In my experience with several hundred incubator babies I have never been able to raise one without breast milk.

Dr. Isaac A. Abt, Chicago: Ordinarily the temperatures of incubators are too high. These babies do not need a temperature of 80 degrees; a little above 75 F. is enough.

Dr. L. E. LaFetra, New York: A temperature of 76 F. is best as it permits the air to be kept moist. If the temperature is higher, the air becomes too dry. Breast milk is desirable, but when it cannot be obtained, modified milk which has been peptonized may be used. Its use is often attended with success.

Dr. Fritz B. Talbot, Boston: The basal metabolism figures are important. The premature baby falls into the class of cold blooded animals. The temperature is dependent on the rate of the metabolic processes. When the temperature is subnormal, the basal metabolism is subnormal. Babies having a subnormal temperature do not gain until the temperature becomes normal, and when they begin to gain the temperature becomes normal and the metabolism goes up.

Dr. J. P. Crozer Griffith, Philadelphia: We have been using an asbestos incubator with the lights below. Premature babies must be kept warm.

Malnutrition in Children of the Well-to-Do

Drs. Charles Gilmore Kerley, Edward J. Lorenza, Jr., and Roger DuBose, New York: In the majority of these cases two features stand out prominently, namely, deficient food intake or imperfect digestion. In one group are those cases in which there is a maladjustment of the different food elements. Usually butter, cream and 4 per cent. milk fat have been crowded. The essential foods are taken indifferently. In the management of these children the fact must be recognized that there must be a healthy desire for food and this is created by the withdrawal of fats and sugars in large measure. Three meals are given daily, at five hour intervals, and nothing but water is allowed between meals. A low fat and sugar diet is given, and skimmed milk, from 16 to 20 ounces only, is allowed. In a second group, hyperacidity of the stomach juices causes defective food intake. The chief symptom of hyperacidity is a lack of desire for food. In cases of long standing, nausea and vomiting are prominent symptoms. Among the etiologic factors in this group are candy, ice cream, irregularity in meal hours, and faulty feeding. This type of patient usually responds to dietetic treatment. Extremes as regards temperature of foods and drink are to be avoided. Condiments, candy, pastry and raw fruits are excluded. A powder consisting of sodium bicarbonate, 2 grains, bismuth subnitrate, 2 grains, and magnesium carbonate, is given fifteen minutes before meals. A third group of cases is that in which defective intestinal mechanics delay stomach emptying. One usually finds defective food intake and poor appetite in those who show a stomach residue after four and one-half hours. In order for a child to have a normal desire for food, there must be an interdigestive period of one hour. Retention is often due to pylorospasm occasioned by an anomaly or lesion lower down in the intestinal tract. It is impossible to outline a plan of treatment that will suit all these cases. In the ptosis cases a snug-fitting abdominal belt with a pad or projecting shelf is worn for months. In cases of dilated cecum, massage and liquid petrolatum have been employed successfully. A fourth group, comparatively small, contains the greatest number of failures. These are the underweight, overactive, anemic, physically retarded, precocious children that one sees only occasionally before the third year. In 125 of these cases with varying degrees of malnutrition I have used yeast. Analysis of the histories fails to show that it has been of any benefit. In fact, the administration of yeast was attended by no signal success in any of the four groups of cases. Likewise, endocrine therapy, with the exception of the use of thyroid in the cretin, has been unsatisfactory. A large majority of our cases of faulty development relate to food intake and utilization. For success in management we must supply the requirements.

DISCUSSION

Dr. L. Emmett Holt, New York: Heretofore most of our attention has been directed to the quality of food, but quantity must also be considered. When the child has never been hungry I instruct that if he does not eat the food placed before him it shall be taken away and that he shall have nothing to eat until the next meal time. When a child finds that if he does not eat his food it will be taken away, he soon learns to take it.

Dr. H. D. Chapin, New York: Dr. Kerley is one of the first to report results from the use of yeast. The newspapers are advertising yeast and advising people to eat it. Whatever we say about it will have some good effect on these advertisers.

Dr. Langley Porter, San Francisco: If these children are put to bed and given proper rest they often improve quickly. It is astonishing what a change of nurses will sometimes do. A nurse skilled in the psychology of childhood, often will in a few days, without change of diet, get the child well.

Dr. Isaac A. Abt, Chicago: We have been using large doses of calcium phosphate and lactate and have obtained some good results.

Pneumococcus Peritonitis in Infancy and Childhood

Dr. Henry Heiman, New York: During five years, 125 cases of genuine peritonitis were admitted to the children's wards at Mount Sinai Hospital, and the pneumococcus was present in only fifteen. It was Type I in five cases; Type II in one case; Type III in no case, and Type IV in three cases. In five out of eight cases the blood cultures were positive for pneumococcus. A high leukocyte count is characteristic. The course of the disease is divided into three phases: (1) Sudden onset with severe abdominal pain, usually generalized, but most marked in the lower right quadrant, rise in temperature, rapid pulse and prostration. The degree of abdominal rigidity is not as marked as in other forms of peritonitis. Signs of fluid are not often elicited. (2) In this phase the condition improves. (3) This stage is characterized by the presence of a circumscribed mass in the abdomen, usually in the umbilical or hypogastric region. The temperature rise becomes intermittent and the patient gradually loses strength from the toxemia. Death ensues from toxemia, or recovery may follow spontaneous rupture through the abdominal wall, or operation. At Dr. Howard Lilienthal's suggestion, abdominal aspiration was done in all suspicious cases. The point of preference for puncture is 1 inch below and 1 inch to the left of the umbilicus; this penetrates an area over the small intestine only. The prognosis depends on the localization of the inflammatory process and the involvement of other organs. We have injected antipneumococcus serum intensively in four cases without avail. The best treatment is to give an abundance of fluid by hyperdermoclysis and proctoclysis, and to keep the patient under the influence of opium during the acute onset of the diffuse process. If toxemia tends to lessen, it is advisable to wait for abscess formation before opening the abdomen. If, however, under supportive treatment no signs of improvement appear, it is best to resort to surgery.

Dr. L. Emmett Holt, New York: One type of pneumococcus peritonitis occurs in those cases in young infants in which the peritonitis is a part of a general pneumonitis. Frequently it gives no symptoms and is found only at necropsy. It is a question not yet settled whether these children should be subjected to operation.

Dr. Isaac A. Abt, Chicago: These cases usually run a malignant course and are difficult to differentiate from appendicitis. A peculiar condition may occur during the course of a pneumococcus peritonitis. The disease starts

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with a stormy onset. After two or three days of high fever and great toxemia, the patient lapses into a calm, semicomatose state that reminds one of the condition one sees when an appendix has ruptured. The patient remains in that state for a day or two, rapidly gets worse, and dies. An exploratory operation may be justified in these cases.

DR. CHARLES G. KERLEY, New York: I have seen quite a number of cases of pneumococcus peritonitis, all of the fulminating type. One of my patients developed a paralytic ileus and died within three days.

DR. P. J. CROZER GRIFFITH, Philadelphia: It is better not to operate until you find whether the trouble is in the abdominal cavity. I know of patients operated on early who died.

Diet in Infancy; Czerny and Kleinschmidt Butter-Flour Mixture

DR. J. P. CROZER GRIFFITH, Philadelphia: Czerny and Kleinschmidt devised a food which permits the employment of a high fat percentage in combination with a high percentage of carbohydrates, but with the protein reduced to approximately that of human milk. They insist on the importance of having the ratio of fat and carbohydrate a fixed one. The proportions recommended by them consist of 7 gm. of butter; 7 gm. of flour; 5 gm. sugar and 100 c.c. of water, to be mixed with varying amounts of milk, according to the age of the patient. The butter is placed in a pan and heated gently over a gentle fire until foaming takes place and until any odor of volatile fatty acids has disappeared. This requires from five to eight minutes. Fine wheat flour is then added. The whole is boiled and rubbed through a fine sieve, and then mixed with the desired amount of previously boiled, cooled milk and the whole kept cool until needed. For children under 3,000 gm. in weight, one-third milk is added to two-thirds butter-flour mixture; for those 3,000 gm. or over, two-fifths milk and three-fifths butter-flour mixture. Children fed by this method resemble healthy breast fed children. The results were particularly fine in weakly and premature infants weighing less than 3,000 gm.

DR. A. GRAEME MITCHELL, Philadelphia: It is important to follow the formula closely. In whatever way the mixture is modified, the amounts of butter and flour remain equal. In certain cases it is an advantage to reduce the amounts of butter to less than 20 gm. each to 300 c.c. of water. In some cases the sugar should be decreased in amount or omitted entirely. The mixture may be used for substitute or complementary feedings. The mixture containing two-thirds of the stock solution and one-third milk may be said to represent: fat, 4.6 per cent.; carbohydrate, 8.2 per cent.; protein, 1.5 per cent., with a caloric of 24.6 to the fluidounce. The fat of the stock solution consists entirely of neutral fat, the fatty acids having been eliminated. This mixture, like other foods, has its indications and contraindications, and success in feeding depends on the proper selection of cases. The food should be given cautiously, if at all, to infants suffering from infantile atrophy. Some cases that one does not expect to respond favorably nevertheless do so. In analyzing the histories of the infants that failed to gain on the butter-flour mixture, it was found that in seven the type of feeding was not responsible for the failure. The two great lessons which the study teaches are that (1) when fed with butter-flour infants may tolerate fat in a manner which can be accomplished probably by no other means known to us, and (2) the remarkable results which so often follow are a strong proof of the great need which the infant's anatomy possesses for a food containing a sufficiently large amount of fat.

DISCUSSION

DR. CHARLES G. KERLEY, New York: This method appears to have been very successful. We should follow it up. It is a rather involved proposition, however, to put into the average family, and it seems to me that we are striving unnecessarily for new procedures. We are using too many proprietary preparations and too much Dryco. These things are being used by men too lazy to study up the suitable formula for the individual child.

DR. OSCAR M. SCHLOSS, New York: I have used the butter-flour mixture and have had the identical experience that Dr. Griffith and Dr. Mitchell report. I think that many babies do much better on this mixture than when fed by the routine methods. The babies do much better than when the same amount of fat is given in an ordinary formula.

DR. HENRY D. CHAPIN, New York: There is a tendency to cut fats off too much. Years ago it was all high fats; now it is low fats or no fats. I think one reason for this is the caloric estimate of food requirements. The different food elements are not interchangeable, particularly in early life.

DR. L. EMMETT HOLT, New York: One element in this formula makes it evident that it is not adapted for long use. I cannot conceive of a child thriving on such a low protein diet for a long time. I think that the failure of condensed milk and of the dry milk preparations is due to their low protein content. One cannot insist too strongly that these unbalanced formulas are not suited to permanent use.

DR. ALFRED F. HESS, New York: The diets which the babies do best on in the infant asylum is Schlüss milk, which is made of 160 c.c. of cream and 160 c.c. of milk to the liter, with a certain amount of flour and sugar. It is similar to this, except that in this mixture the fatty acids are driven off. On this diet not only do the children thrive, but the texture of the skin and muscles is much better than that of the average bottle fed baby. The mixture we use seems to work, in spite of the fact that it contains fatty acids.

DR. J. CLAXTON GITTINGS, Philadelphia: It does not seem rational to reduce the percentage of volatile fatty acids. I have had a gain in weight when the volatile fatty acids were present in the food that I did not get in any other way.

DR. J. P. CROZER GRIFFITH, Philadelphia: Twenty-five men who have used this mixture admit that the results are surprisingly good, and they are better than I have seen with any other method. It is not a new mixture; it was used long before physicians took it up. I am a percentage feeder, but I think there is a great deal more involved in this method than simply percentages. It is not meant for temporary feeding, but for prolonged feeding. I have followed out this method of feeding long enough to be convinced of its advantages.

DR. A. GRAEME MITCHELL, Philadelphia: This is a percentage method. It simply means a way to get the infant to take more fat. I cannot say that it is a food to be used indefinitely. If you search the stools you find no fatty acids. It is simply a method that helps those infants that do not get along well on cow's milk mixtures, and it may be true that it can be used indefinitely.

Use of Thick Cereal Mixtures in Difficult Feeding Cases

DR. HENRY D. CHAPIN, New York: Observations were made on twenty infants with obstinate indigestion which had resulted in distinct malnutrition and pointed to the hopeless marasmus which finally resists all aid. Three mixtures were employed. The first was composed of 4 ounces from one quart of milk, 2 ounces of skimmed milk, 7 ounces of water, and 3 level tablespoonfuls of farina, with 1 level tablespoonful of granulated sugar. The mixture was boiled one-half hour, and the children were given 3 ounces every four hours, and water alternately. The second formula was similar to this, except that it called for 15 ounces of skimmed milk and 6 ounces of water, and the baby was fed 3½ ounces every four hours. The third formula called for 4 ounces of top milk from a quart of milk, 28 ounces of skimmed milk, 9 ounces of water, 4½ level tablespoonsful of farina, 1 level tablespoonful of granulated sugar and 1 level tablespoonful of malt sugar. From 4 to 6 ounces were fed every four hours, and water every four hours alternately. When vomiting was a feature, the thick cereal mixture did better than liquid food and were always tried first with a spoon. They might be given by the bottle by enlarging the hole in the rubber nipple. The effects of this feeding were occasionally uncertain, usually good and sometimes remarkable. Laboratory analysis of the stools shows that the percentage utilization of carbohydrates in these children is practically equal to that of normal children and adults.

(To be continued)

Current Medical Literature

AMERICAN

Titles marked with an asterisk (*) are abstracted below.

American Journal of Hygiene, Baltimore

May, 1921, 1, No. 3

Physiology of Reproduction in Domestic Fowl. XIX. Influence of Free Choice of Food Materials on Winter Egg Production and Body Weight. R. Pearl and T. E. Fairchild, Baltimore.—p. 253.
Certain Minimums and Maximums in Tuberculosis Control. D. B. Armstrong.—p. 278.
*Antipneumococcus Protective Substances in Normal Chicken Serum. C. G. Bull and C. M. McKee, Baltimore.—p. 284.
*Significance of Albumin and of Albumin with Casts in Urine. L. I. Dublin, New York.—p. 301.
*Toxic Substance Obtained by Growing Hemolytic Streptococci in a Special Medium. L. C. Havens and M. L. Taylor, Baltimore.—p. 311.
Life History of Vahlkampfia Patuxent N. Sp., Parasitic in Oyster with Experiments Regarding Its Pathogenicity. M. J. Hogue, Baltimore. —p. 321.
*Natural and Acquired Antisheep Hemolysins of Rabbit as Regards Thermolability. R. R. Hyde, Baltimore.—p. 346.
Reactivation of Natural Hemolytic Antibody in Chicken Serum. R. R. Hyde, Baltimore.—p. 358.

Antipneumococcus Protective Substances.—It is shown by Bull and McKee that the serum of normal chickens is capable of protecting mice and guinea-pigs against infection with pneumococci. The protective substances are found in the water-insoluble fraction of the serum globulin. Chicken serum contains particular protective substances for each serologic type of pneumococcus. These substances are selectively removed from the serum by the process of bacterial adsorption. In terms of the protective substances in chicken serum, Types II and II B pneumococci constitute two distinct main groups and Type II strains form a subgroup to both of them.

Significance of Albumin and Casts in Urine.—A study was undertaken by Dublin to determine, if possible, the importance of persistent albumin and of albumin with casts as a physical defect measured in terms of mortality. It is based on the after-life history of about 5,200 persons who were rejected for insurance in the period between 1905 and 1915. So far as it was possible the study was limited to cases in which there were no other serious complications which are often found in connection with albuminuria. The first group studied consisted of 2,073 persons who showed albumin on several examinations in amounts exceeding the slightest possible trace. A total of 161 deaths occurred among them during this period. This is the actual mortality. According to Glover's table, 141 deaths should have occurred among these people. The actual deaths were, therefore, 114 per cent. of the expected according to the table. On the American men table, only eighty-eight deaths would have occurred as against 161. The actual mortality was, therefore, 183 per cent. of that which might have been expected in a group of insured people at the same ages who were presumably free from serious defects. It would appear, therefore, that the persistent presence of albumin in quantities above the slightest possible trace is a serious impairment. Cases with albumin and casts numbered 3,264 persons with 452 deaths. The death rate, therefore, was 20.5 per thousand for those having albumin only. The seriousness of the presence of albumin with casts is reflected also in the death rates for the various diseases. The mortality rate is high for virtually every important cause of death. The cancer rate is twice as high; diabetes is almost three times as high; tuberculosis is over three times as high. The extra mortality from this disease is not influenced so much by age as by the amount of albumin. Apoplexy and cerebral hemorrhage give rates four times as high as in the ordinary experience; organic heart disease, over four times and Bright's disease, twelve times. Over 40 per cent. of the deaths of persons showing a large amount of albumin with casts at the ages over 40 were from Bright's disease and the death rate from this disease alone was 3,103 per hundred thousand. These persons would, therefore, appear to have been at the time of examination already suffering from Bright's disease or well on the road to this condition. The gravity of the impairment varies directly with the amount of albumin and not quite so regularly with the advancing age of the applicant. The presence of casts adds materially to the gravity of the impairment and granular casts add more to the defects than do hyaline casts. At the older ages, the presence of casts, together with albumin, is indicative of a condition of the greatest seriousness. At the younger ages, the presence of a trace or more of albumin or of albumin with casts, suggests the existence of tuberculosis in many cases.

Special Culture Medium for Hemolytic Streptococci.—A special medium is described by Havens and Taylor in which a specific toxic substance has been produced during the growth of certain strains of hemolytic streptococci. This toxic product is filtrable and the filtrates have a definite pathogenic action when injected into mice, rabbits and guinea-pigs. The poison possesses definite antigenic properties and the serum of rabbits immunized with such toxic filtrates gives protection both against infection with the cultures and against intoxication with the filtrates. The medium used consisted of 1 per cent. peptone, 1 per cent. disodium phosphate and 0.5 or 1 per cent. glucose added to an ordinary meat infusion made with distilled water, and the reaction adjusted to a p_H of from 8.0 to 8.2. The medium is tubed, about 10 c.c. to a tube, and autoclaved at ten pounds' pressure for ten minutes. A fragment of sterile rabbit kidney and 1 c.c. of defibrinated sheep or rabbit blood are now put in each tube. The medium is then ready for use and, to obtain the best results, should be inoculated at once, without incubation to determine sterility. In this medium the hemolytic streptococcus grows readily and abundantly.

Natural Hemolysins.—Hyde found that the natural hemolysins of the rabbit for sheep corpuscles are as heat resistant as the corresponding immune hemolysins. The apparent difference in the thermolability of natural and immune hemolysins is due to the relative potency of the serum, the more potent serum apparently being more resistant to heat. Hemolysins are just as resistant to heat when in salt solution as in undiluted serum.

American Journal of Ophthalmology, Chicago

June, 1921, 4, No. 6

Advantages of Trifocal Lenses and Reasons Why They Should be Worn. J. A. Spengler, Geneva, N. Y.—p. 401.
The Nature and Treatment of Strabismus. C. Deloge, Nice, France. —p. 407.
Metastic Infiltration of Cornea (Ring Abscess). A. C. Snell, Rochester, N. Y.—p. 419.
Foreign Body Impacted in the Sclera and Retina, Loosened Under Direct Observation with Ophthalmoscope and Removed. J. M. Patton, Omaha.—p. 422.
Glaucoma after Cataract Extraction. E. Stieren, Pittsburgh.—p. 424.
Clinical Observations with Slit Lamp of Gullstrand. H. S. Gradle, —p. 427.
Radium Applicator for Cataracts. W. C. Franklin and F. C. Cordes, San Francisco.—p. 429.
Ocular Conditions Associated with Arthritis Deformans. H. Friedenwald, Baltimore.—p. 431.
Extreme Hypermetropia. A. O. Pfingst, Louisville.—p. 436.
Objective and Subjective Tremors as Functional Disorders Due to Eyestrain. W. W. Kahn, Detroit.—p. 438.
Blocking of Facial Nerve in Cataract Operations. R. E. Wright, Madras, India.—p. 445.
Release of Iritic Adhesions to Anterior Capsule of Lens by Suction Pump Massage. H. V. Würdemann, Seattle, Wash.—p. 446.
Proper Treatment of Acute Suppurative Dacryocystitis. J. M. Ball, St. Louis.—p. 447.
New Operation for Treatment of Lacrimal Obstruction. J. A. MacMillan, Montreal.—p. 448.
Subconjunctival Injections of Drugs for Intensive Action on Iris. W. B. Doherty, New York.—p. 450.

American Journal of Public Health, Boston

June, 1921, 11, No. 6

Health Education in Industry. C. E. Ford, New York City.—p. 489.
Some Aspects of Pollution as Affecting Oyster Propagation. T. C. Nelson, New Brunswick, N. J.—p. 498.
Infant Mortality in Detroit. G. T. Palmer and G. A. Blakeslee, Detroit. —p. 502.
Cholera Prevention Campaign in Foochow. W. W. Peter.—p. 508.
Phenol Coefficients. F. W. Tilley, Washington, D. C.—p. 513.
Special Objectives of Physical Education with Relationships to Public Health. C. W. Hetherington, Sacramento, Calif.—p. 520.
Review of Our Knowledge of Bacterium Tularense. C. W. Chapin, Washington, D. C.—p. 529.
Comparison of Two Methods of Adjusting Hemolytic System for Use in the Complement Fixation Test for Syphilis. H. V. Langworthy and F. L. Willson.—p. 532.

The Family Doctor and the General Hospital in the Anti-Tuberculosis Campaign. F. C. Smith, Washington, D. C.—p. 534.
Conquest of Mosquito-Borne Diseases. C. V. Craster, Newark, N. J. —p. 538.

American Review of Tuberculosis, Baltimore

June, 1921, 5, No. 4

Tuberculosis: Rationale of Research. G. B. Webb, Colorado Springs, Colo.—p. 271.
Comparative Study of Pathology and Roentgen Ray Densities of Tuberculosis Lung Lesions. H. K. Dunham and J. H. Skavlem, Cincinnati.—p. 278.
*Apical Pleuritis and Its Relationship to Pulmonary Tuberculosis: Statistical Study of Stereoscopic Roentgenograms of 366 Consecutive Adult Chests. J. G. Van Zwaluwenburg and G. P. Grabfield, Ann Arbor, Mich.—p. 323.
*Tuberculous Empyema. G. B. Kalb, Monrovia, Calif.—p. 339.
Campaign Against Tuberculosis. J. M. Anders, Philadelphia.—p. 345.
Are Eating Utensils Carriers of Tubercle Bacilli? H. L. Taylor, St. Paul.—p. 351.

Relationship of Pulmonary Tuberculosis to Apical Pleuritis.—Van Zwaluwenburg and Grabfield found that pleural shadows over the apices in various forms occur with great frequency. By insensible gradations these shadows pass into those of frank pulmonary tuberculosis. The demonstrated association with pulmonary tuberculosis demonstrates a prevailingly tuberculous nature. Chronologically the apical pleuritis precedes the pulmonary involvement. The prevailing tendency to spread is to the opposite apex and to the underlying lung. The infection probably reaches the pleurae through the cervical lymphatics.

Tuberculous Empyema.—Ten cases are analyzed by Kalb. Two of these patients were treated by thoracotomy and both died with their complication unbenefited. In fact, the end was hastened by the very means taken to cure them. Of the seven remaining, all are alive, and all have been relieved of their complication. Two of these were what may be termed cases of spontaneous empyema, and five occurred during the course of treatment by artificial pneumothorax. The patients were all treated by the method instituted by Murphy. All of the purulent material that is possible is removed by aspiration or siphonage or both combined, using a large needle. Then a 2 per cent. solution of liquor formaldehyd in glycerin is injected, the amount varying according to the amount of fluid withdrawn.

Archives of Neurology and Psychiatry, Chicago

July, 1921, 6, No. 1

*Sensory Changes in Subacute Combined Degeneration of Pernicious Anemia. A. S. Hamilton and C. E. Nixon, Minneapolis.—p. 1.
*Myelitis and Myelomalacia. P. Bassoe and G. B. Hassin, Chicago.—p. 32.
Epidemic Encephalitis: Clinical and Pathologic Study of Twenty-Five Cases. M. E. Alexander, Waterbury, Conn.—p. 44.
History of Lumbar Puncture (Rachicentesis). H. Gray, Boston.—p. 61.
Preparation of Colloidal Gold Solution for Testing Spinal Fluid. E. O. Gettler and J. W. Jackson, New York.—p. 70.

Sensory Changes in Pernicious Anemia.—Changes in the nervous system, Hamilton and Nixon state, occur in pernicious anemia in from 70 to 80 per cent. of the patients as they present themselves in the ordinary physician's practice. The frequency of these changes is ordinarily underestimated. Subjective sensory disturbances constitute the earliest and most frequent evidence of involvement of the nervous system. These, with the objective signs also, are often the earliest evidence of the development of pernicious anemia. The most characteristic sensory findings are the relatively greater loss of deep as compared with superficial sensibility, but there is by no means normal sensibility to touch, prick and other forms of superficial sensibility. Almost equally as characteristic as the change in deep sensibility, is the complaint of subjective sensory disturbances. There is a distinct lack of parallelism between the severity of the blood and nervous phenomena, and either may precede the other by a long period of time. Moreover, marked remissions in the blood picture, either with or without splenectomy, may fail to show a betterment in the sensory disturbances equal to that in the blood, and may show none at all. Contrary to the generally expressed opinion, degenerative changes in the peripheral nerves are common in pernicious anemia and constitute an important part of the pathologic anatomy of that disease. These changes in the peripheral nerves my serve to explain the disharmony between the sensory phenomena and the changes in the spinal cord existing in certain cases, and in all cases have to do with the production of sensory disturbances; they are especially important in those cases in which marked remissions of sensory phenomena occur. Vibration sensibility may be lost without loss of sense of passive joint movement and vice versa, and it is possible that the long fibers carrying these two forms of sensibility pass up the cord sufficiently separated so that beginning lesion in the posterior column may involve either one or the other alone at an early stage or, in accordance with Petren's view, it may be that the fibers subserving joint sensibility, at least, may pass up the cord in two pathways.

Myelitis and Myelomalacia.—A clinicopathologic study was made by Bassoe and Hassin, especially as to the fate of gitter cells. In one of the cases recorded the morbid phenomena were most probably due to a pure inflammatory condition of the spinal cord, myelitis, while the second case with the clinical picture of transverse myelitis was due to an extensive softening of the spinal cord with interesting histologic features. The histopathologic findings in a typical case of so-called "yellow" softening of the spinal cord, myelomalacia, are analogous to those found in acute softening of the brain, encephalomalacia. Myelomalacia, the authors claim, is not an inflammation, but a degeneration of the spinal cord. The degenerative or regressive nerve fiber changes are associated with progressive glia phenomena, principally in the form of gitter cell formation. The gitter cells in this as in any other type of secondary degeneration, are gliogenous formations. Their task is to transform destroyed nerve tissue into fatlike substances and to transport these substances to mesodermic structures, such as blood vessels and the pia. Reaching these structures, they are actively taken up by the proliferating adventitial and pial elements. From the adventitial and pial spaces they are carried to the subarachnoid space and thence to the blood for final elimination. The subarachnoid space is to be looked on as the "dumping ground" for any waste accumulated in the central nervous system.

California State Journal of Medicine, San Francisco

June, 1921, 19, No. 6

Medical Aspects of Visceroptosis. G. E. Ebright, San Francisco.—p. 221.
Another Problem in Surgery. W. A. Clark, Oakland.—p. 223.
Treatment of Tuberculosis with Partigens (after Muchdeycke). M. Rothschild, San Francisco.—p. 226.
Protection of Perineum by Episiotomy in Delivery at Term. D. L. Martin, San Francisco.—p. 229.
Problems in Plastic Surgery. G. W. Pierce, San Francisco.—p. 230.
Influence of Epinephrin on Nephritis and Its Complications by Injection into Kidneys. G. L. Eaton, San Francisco.—p. 233.
New Obesity Cures for Old or the Chiropractic Thurst. L. H. Peters, Los Angeles.—p. 237.
Amebic Abscess of Liver. P. K. Gilman, San Francisco.—p. 239.
Treatment of Bladder Tumors by Radiation and Fulguration. R. L. Rigdon, San Francisco.—p. 243.
Peripheral Nerve Surgery. C. L. Tranter, San Francisco.—p. 244.
Organized Medicine for Masses a Feature of Present-Day Medical Practice. E. W. Cleary, San Francisco.—p. 245.
Endocrines and Their Influence on Skin. A. Davidson, Los Angeles. —p. 248.
Clinical Usefulness of Orthocardiogram and Cardiac Pattern. H. Spiro, San Francisco.—p. 251.

Canadian Journal of Mental Hygiene, Toronto

April, 1921, 2, No. 1

Application of Binet-Simon Tests (Stanford Revision) to Toronto Public School. E. J. Pratt, Toronto.—p. 95.
Vancouver's Subnormal Problem. A. J. Dauphinee, Vancouver.—p. 117.

Iowa State Medical Society Journal, Des Moines

June 15, 1921, 11, No. 6

Some Aphorisms of Endocrines. H. M. Brown, Milwaukee.—p. 189.
Cerebral Arteriosclerosis. F. A. Ely, Des Moines.—p. 195.
How Are We Treating the Eustachian Tube? F. W. Sallender, Sioux City.—p. 199.
Treatment of Eustachian Tube and Middle Ear. H. M. Ivins, Cedar Rapids.—p. 201.
Use of Roentgen Rays and Radium in Treatment of Certain Nonmalignant Conditions. A. W. Erskine, Cedar Rapids.—p. 203.
Acute Appendicitis in Children. G. T. McCauliff, Webster City. —p. 205.
Treatment of Tuberculosis, Based on Its Clinical Cause. W. H. Ross, Waterloo.—p. 207.
*Case of Cardiospasm with Enormous Dilatation of Esophagus. T. J. Snodgrass, Janesville, Wis.—p. 212.

Cardiospasm with Dilatation of Esophagus.—Snodgrass' patient, aged 66, had had trouble in swallowing since he was 14. Food would stay in his esophagus several hours and then he would have to spit it out. This continued without treatment for forty years. Seven years ago, he had influenza, and from that time he grew steadily worse in regard to his swallowing. It required enormous pressure to force food into the stomach. He found that he could eat practically a whole meal before swallowing it. It would then be necessary for him to leave the table, throw his arms back, grasp something firmly, take a drink of water, throw his head back and thus, with enormous pressure, force the food into his stomach. It would shoot in with a very audible whistling sound. The esophagus, however, was never entirely emptied and every morning he would throw out a large amount of food that had been taken the night before. He had no particular distress after eating; he never vomited. His bowels were regular; he had a slight brassy cough; no pain; was somewhat nervous and ill-nourished. On giving him a bismuth meal it was found that no food passed into his stomach; the esophagus was enormously dilated, was narrowed down by a small stricture in the region of the cardia about 1½ inches long and ¼ inch wide. By means of bougies and a hydrostatic dilator the stricture was gradually stretched so that normal function of the gastro-intestinal tract was secured.

Journal of Experimental Medicine, Baltimore

July 1, 1921, **34**, No. 1

*Experimental Studies of Nasopharyngeal Secretions from Influenza Patients. P. K. Olitsky and F. L. Gates, New York.—p. 1.
*Reactions of Nasal Cavity and Postnasal Space to Chilling of Body Surface. S. Mudd, A. Goldman and S. B. Grant, St. Louis.—p. 11.
*Concentrating Activity of Gallbladder. P. Rous and P. D. McMaster, New York.—p. 47.
*Physiologic Causes for Varied Character of Stasis Bile. P. Rous and P. D. McMaster, New York.—p. 75.
Studies on Bacterial Nutrition. Growth Accessory Substances in Cultivation of Hemophilic Bacilli. T. Thjötta and O. T. Avery, New York.—p. 97.
Studies on the D'Herelle Phenomenon. A. Gratia, New York.—p. 115.

Experimental Influenza.—During the course of animal experiments with the anaerobic filterpassing organisms cultivated from epidemic influenzal sources, certain pulmonary infections with ordinary bacteria have been observed by Olitsky and Gates. The experiments have also shown that the lungs of animals infected with *Bacterium pneumosintes* are less resistant than normal lungs to infection with ordinary bacteria. These observations furnish additional proof of the identity of *B. pneumosintes* and the active agent derived from the nasopharyngeal secretions of patients in the early hours of epidemic influenza.

Mucous Membranes and Chilling.—Chilling of the body surface has been shown by Mudd et al to cause reflex vasoconstriction and ischemia in the mucous membranes of the palate, palatine tonsils and pharynx. The present study demonstrates a like reflex diminution in the blood supply of the nasal cavity and postnasal space (nasopharynx).

Concentrating Activity of Gallbladder.—Rous and McMaster state that a gallbladder emptied at the beginning of one experiment and left to fill from the liver concentrated the 49.8 c.c. of bile reaching it in twenty-two and a half hours to 4.6 c.c., that is to say, reduced its bulk 10.8 times; while another bladder left distended with a bile of known constitution and receiving in addition fresh increments from the liver concentrated the secretion 8.9 times in twenty-two hours. A series of five emptied bladders concentrated the bile coming to them in about twenty-four hours on the average 7.1 times or a little more than the 6.4 times of seven organs left full. The rapidity with which fluid is withdrawn through the wall of the bladder may be judged from some experiments in which a bag was connected with the tip of the organ by a large cannula. Merely in its passage through the bladder, the bile was concentrated from 2.3 to 4.8 times. The finding indicates a potential source of error in observations upon samples of bile obtained from fistulous channels of which the bladder forms a part. The authors found that the bile ducts do not withdraw fluid from the secretion they convey but tend to dilute it; hence concluded that the restriction of the concentrating activity to the receptaculum chyli is good evidence that the latter has special significance for the organism. The nature of this significance is briefly discussed.

Stasis Bile.—The gallbladder and ducts exert opposite influences on the bile. The ducts fail to concentrate and thicken it with mucus as the bladder does, but dilute it slightly with a thin secretion of their own that is colorless and devoid of cholates even when the organism is heavily jaundiced. In obstructed ducts separated from the gallbladder, or connecting with one so changed pathologically that the concentrating faculty has been lost, such fluid gradually replaces the small amount of bile originally pent up. It is the so-called "white bile" of surgeons. When obstructed ducts connect with an approximately normal gallbladder the stasis fluid is entirely different, owing to the bladder activity. At first, there accumulates in quantity a true bile much inspissated by loss of fluid through the bladder wall, darkened by change in the pigment, and progressively thickened with bladder mucus. As time passes, duct secretion mingles with the tarry accumulation and very gradually replaces it. The inspissation of the bile, as indicated by the pigment content, is at its greatest after only a day or two of stasis. Rous and McMaster are convinced that the differing influences of the ducts and bladder on the bile must obviously have much to do with the site of origin of calculi and their clinical consequences. The concentrating activity of the bladder cannot but be a potent element in the formation of stones. The hemophilic bacteria, of which *B. influenzae* serves as a type, Thjötta and Avery state, require for their growth two distinct and separable substances, both of which are present in blood and neither of which alone suffices. These substances are (*a*) a vitamin-like substance which can be extracted from red blood corpuscles, from yeast, and from vegetable cells, which is relatively heat-labile and absorbed from solution by certain agents; (*b*) a so-called X substance which is present in red blood cells, is heat-stable, and acts in minute amounts.

Journal of General Physiology, Baltimore

May 20, 1921, **3**, No. 5

Methods of Studying Respiratory Exchange in Small Aquatic Organisms, with Particular Reference to Use of Flagellates as an Indicator for Oxygen Consumption. H. M. Fox, Cairo, Egypt.—p. 565.
Phagocytosis of Solid Particles. W. O. Fenn, Boston.—p. 575.
Sucrolytic Actions of Bananas. K. G. Falk and G. McGuire, New York.—p. 595.
Theory of Injury and Recovery. III. Repeated Exposures to Toxic Solutions. W. J. V. Osterhout, Cambridge, Mass.—p. 611.
Rate of Growth of Dairy Cow. S. Brody and A. C. Ragsdale, Columbia, Mo.—p. 623.
Casein Viscosity Studies. H. F. Zoller, Washington, D. C.—p. 635.
Significance of Latency Time in Enzyme Determination. L. G. M. Baas-Becking, Pacific Grove, Calif.—p. 653.
Associative Bacterial Action in Propionic Acid Fermentation. J. M. Sherman and R. H. Shaw, Washington, D. C.—p. 657.
Physiological Zero: Explanation of Departure from Linear Graph of Reaction Rate Values at Lower Temperatures. J. Krafka, Jr., Athens, Ga.—p. 659.
Decreased Respiration and Recovery. O. L. Inman, Cambridge, Mass.—p. 663.
Donnan Equilibrium and Physical Properties of Proteins. I. Membrane Potentials. J. Loeb, New York.—p. 667.

Journal of Laboratory and Clinical Medicine, St. Louis

June, 1921, **6**, No. 9

Relation of Differentiation and Lymphocytic Infiltration to Postoperative Longevity in Gastric Carcinoma. W. C. MacCarty and A. E. Mahle, Rochester, Minn.—p. 473.
*Alkali Reserve of Blood Plasma During Protein Shock. A. A. Eggstein, New York.—p. 481.
*Resistance of Red Blood Cells. In Disease to Hemolytic Action of Sapotoxin. C. H. Neilson and H. Wheelon, St. Louis.—p. 487.
System of Laboratory Examinations and Records. J. A. Kolmer, Philadelphia.—p. 505.
Modification of Technic of Vividiffusion Method of Abel. H. C. Van der Heyde and W. Morse, Morgantown, W. Va.—p. 520.

Alkali Reserve of Blood Plasma During Protein Shock.—Secondary proteoses and typhoid bacteria were the toxic substances used by Eggstein to produce shock in dogs and humans. The alkali reserve of the blood plasma was greatly decreased and there was a definite relationship between the decrease in the alkaline reserve of the plasma and the lowered blood pressure in toxemic shock. When the alkali reserve of the blood falls below 30 volumes per cent., following protein shock, the animal's life is in danger. The admin-

istration of sodium bicarbonate preliminary to the injection of a toxic protein retards the fall of the blood alkalis to this critical point. When the alkali reserve has been lowered in protein shock, it may be restored by the intravenous administration of sodium bicarbonate, which apparently relieves distressing symptoms.

Resistance of Blood Cells.—The resistance of the red cells to sapotoxin solutions Neilson and Wheelon state varies in different diseases and this variation is intimately associated with alterations in the metabolism of cholesterol. Pregnancy, pulmonary tuberculosis, lead poisoning and cardiorenal diseases are associated usually with an increased resistance of the red cells to sapotoxin. Syphilis and anemia associated with syphilis and hemolytic jaundice show a lessened degree of resistance of the red cells to sapotoxin. Typhoid appears to alter but little the resistance of the red cells.

Kansas Medical Society Journal, Topeka

June, 1921, **22**, No. 6

Problems in Surgery of Gallbladder and of Bile Ducts. E. S. Judd, Rochester, Minn.—p. 186.
Focal Infection. L. J. Wheeler, Great Bend.—p. 190.
Hormones and Hormone Action. C. F. Nelson, Lawrence.—p. 192.

Kentucky Medical Journal, Bowling Green

June, 1921, **19**, No. 6

Disturbance in Cardiac Functions. J. E. Greiwe, Cincinnati.—p. 295.
*Hydatidiform Mole; Report of Case. E. L. Henderson and J. G. Sherrill, Louisville.—p. 301.
Value of Blood Urea Determination in Medical and Surgical Cases. M. S. Grant, Berea.—p. 303.
*Complete Traumatic Rupture of Kidney: Report of Case. S. Graves and J. A. Casper, Louisville.—p. 304.
Hypertrophic Pyloric Stenosis Operation: Recovery: Case Report. G. Fulton, Louisville.—p. 306.
*Paralysis Agitans; Sequel of Influenza. J. J. Moren, Louisville.—p. 308.
Invagination of Ileum: Resection: Recovery: Case Report. J. G. Sherrill, Louisville.—p. 310.
Present Methods in Treatment of Fractures. J. G. Sherrill, Louisville.—p. 310.
Perforated Duodenal Ulcer: Closure: Gastro-Enterostomy: Recovery: Case Report. L. W. Frank, Louisville.—p. 318.
Radium. C. J. Broeman, Cincinnati.—p. 320.
Brain Tumor (Glioma): Report of Case. B. F. Zimmerman, Louisville.—p. 327.
Case of Extra-Uterine Pregnancy at End of Third Month with Rupture. F. I. Koontz, Louisville.—p. 331.
Successful Ligation of Common Femoral Artery; Case Rpeort. L. R. Ellars, Louisville.—p. 334.
Operative Relief of Congenital Pyloric Stenosis. T. D. Smith, Louisville.—p. 335.
Lethargic Encephalitis. S. J. Myers, Louisville.—p. 338.
Heart and Its Capacity for Work; Guide in Diagnosis and Treatment. H. P. Sights, Paducah.—p. 343.
Bacillus Coli Infection of Prostate and Seminal Vesicles: Report of Five Cases. C. G. Hoffman, Louisville.—p. 356.
Treatment of Gonorrhea in Female. T. C. Holloway, Lexington. p. 360.
Measles. G. P. Bailey, Harlan.—p. 369.

Case of Hydatiform Mole.—The interesting features connected with this case are the fact that none of the hydatiform mass escaped from the uterus which would have made the diagnosis easy. Two features, however, seemed to be important signs of missed pregnancy or mole, namely: the discharge of a large amount of clear fluid and the soft semifluxuant feel of the uterus with only slight effort at contraction and the absence of fetal heart sounds. Hysterotomy was done and the hydatiform mole, the result of a missed pregnancy, was removed. The mole was separated with difficulty from the mucosa. The hydatiform mass about filled a quart cup.

Case of Complete Traumatic Rupture of Kidney.—Graves and Casper's patient sustained a rupture of the right kidney as the result of a fall down stairs. After being picked up he complained of pain in his back and right side and soon fainted. He was aroused in a few minutes and during the night complained of pain. He could not urinate and a small amount of bloody urine was obtained by catheterization. Patient was evidently in shock. Physical examination showed dulness and marked tenderness over right loin at level of the third and fourth lumbar vertebrae. There was general tenderness over his abdomen; no fluid in abdomen. He had intense thirst since the accident and had been extremely restless. He died about twenty-four hours after the accident. The necropsy disclosed a complete transverse rupture of the right kidney.

Paralysis Agitans; Sequel of Influenza.—Moren's patient was 7 years of age. Following an attack of influenza she developed paralysis agitans, the right side being involved to a greater extent than the left. There was practically no tremor so long as she remained quiet, but on attempting to walk typical symptoms of paralysis agitans were noted.

Maine Medical Association Journal, Portland

June, 1921, **11**, No. 11

Type of Operation in Appendicitis. E. H. Risley, Waterville.—p. 327.
Lymphatic Leukemia—Report of Two Cases. M. Warren, Portland. —p. 333.

Laryngoscope, St. Louis

May, 1921, **31**, No. 5

Some Indications for Operation on Nasal Sinuses in Children. L. W. Dean and M. Armstrong, Iowa City.—p. 273.
Mosher-Toti Operation on Lachrymal Sac. H. P. Mosher, Boston. p. 284.
Juvenile Nasopharyngeal Fibroma—Report of Case Treated by Kocher's Osteoplastic Method. G. A. Wall, Tulsa, Okla.—p. 287.
Polypoid Degeneration of Lining of Antrum of Highmore. F. P. Emerson, Boston.—p. 292.
Diagnosis and Treatment of Maxillary Sinusitis. H. V. Dutrow, Dayton, Ohio.—p. 296.
Acute Bilateral Mastoiditis, Meningitis Aseptic. Operation. Recovery. H. M. Hays, New York.—p. 302.
Principles Involved in Roentgen-Ray Treatment of Tonsils. W. D. Witherbee, New York.—p. 305.
Chronic Mastoiditis with Extensive Cholesteatoma. H. F. Lampe, New York.—p. 307.
Chronic Purulent Otitis Media. A. A. Schwartz, New York.—p. 311.
Primary Mastoiditis with Perisinus and Extradural Abscess—Operation —Recovery. O. Diogan, New York.—p. 318.
Dislocation of Epiglottis. F. T. Hill, Waterville, Maine.—p. 320.

Medical Record, New York

June 18, 1921, **99**, No. 25

Moral Center in Brain. W. Browning, Brooklyn.—p. 1043.
Vaccination Against Tuberculosis. K. von Ruck and R. E. Flack, Asheville, N. C.—p. 1048.
Treatment of Sterility by Means of Organic Extracts. A. Bercovitch, Winnipeg, Manitoba.—p. 1052.
Insanity. S. Block, Brooklyn.—p. 1055.
Urology: Its Place in Medicine. H. W. E. Walther, New Orleans. —p. 1058.
Case of Chronic Nephritis with Renal Neoplasm. C. G. Cumston, Geneva, Switzerland.—p. 1060.

June 25, 1921, **99**, No. 26

Moral Center in Brain. W. Browning, Brooklyn.—p. 1090.
Suprapubic Prostatectomy. E. H. Eising, New York.—p. 1094.
Why Not Elimination? G. L. Servoss, Reno, Nev.—p. 1097.
Diphtheria. L. Curtis, Chicago.—p. 1098.
Concept of Roentgen-Ray Pathology: XV. Roentgen-Ray Literature. A. J. Pacini, Washington, D. C.—p. 1099.

Nebraska State Medical Journal, Norfolk

June, 1921, **6**, No. 6

Physician as a Citizen. M. S. Moore, Gothenburg.—p. 161.
Neurocirculatory Asthenia. Review of Literature and Reports of Cases in Discharged Soldiers. M. J. Breuer, Lincoln.—p. 163.
Technic for Complete Appendectomy. K. S. J. Hohlen, Lincoln. —p. 174.
Civilian Surgeon's Story of Great War. H. W. Orr, Lincoln.—p. 176.
Etiology, Treatment and Results in One Hundred Cases of Backache. A. L. Smith, Lincoln.—p. 179.
Focal Infection and Its Relationship to Systemic Disease. A. F. Tyler, Omaha.—p. 181.
Medical Drainage of Gallbladder. A. Sachs, Omaha.—p. 184.

New Jersey Medical Society Journal, Orange

June, 1921, **18**, No. 6

Stomach Case. G. K. Dickinson, Jersey City.—p. 171.
Reminiscences or Thoughts and Impressions from a Study of Mental Diseases. T. J. Smith, Bridgeton.—p. 174.
Bronchial Asthma. H. L. Alexander, Newark.—p. 179.
Sporadic Cretinism (Infantile Myxedema.) H. I. Golstein, Camden. —p. 184.
Psychiatric Institute. F. M. Allen.—p. 189.

New Orleans Medical and Surgical Journal

June, 1921, **73**, No. 12

Missed Abortion. E. L. King, New Orleans.—p. 502.
Corrective Rhinoplasty. A. I. Weil, New Orleans.—p. 507.
Nineteen Radical Sinus Operations (Knapp) Done Under Local Anesthesia M. P. Boebinger, New Orleans.—p. 518.
Hero Doctor. H. Dupuy, New Orleans.—p. 529.

FOREIGN

Titles marked with an asterisk (*) are abstracted below. Single case reports and trials of new drugs are usually omitted.

British Medical Journal, London

June 11, 1921, 1, No. 315

*Limps in Children. J. Fraser, Edinburgh.—p. 843.
*Residual Vaccines. C. E. Jenkins.—p. 846.
Lethargic Encephalitis. G. S. Haynes, Cambridge.—p. 849.
Ocular Symptoms in Slighter Cases of Lethargic Encephalitis. R. Pickard, Exeter.—p. 851.
*New Growth and Reducing Substance in Blood. A. S. Leyton and H. G. Leyton, Cambridge.—p. 852.
Path of Toxins to Central Nervous System. M. Button, Rye, Sussex. —p. 853.

May, 1921, 2, No. 5

Problems in Neurology: Argyl Robertson Pupil. S. A. K. Wilson.—p. 1.
Analytical Interpretations. M. Nicoll.—p. 26.

Limps in Children.—Fraser divided these limps into functional limps, painful limps, flaccid limps, spastic limps, mechanical limps and stiff limps. The diagnosis can be made by means of observation alone. Each individual condition must be treated on independent and special lines. If the limp is functional the less attention paid to it the better. Sympathy and local treatment will probably intensify and prolong it. Painful limps call for early and careful treatment by rest and immobilization of the painful part. Flaccid limps usually owe their origin to poliomyelitis hence prevention is better than cure. When the limp has become established mechanical treatment and operative treatment offer the most promising lines of treatment. Mechanical treatment by splints in children is often disappointing. Spastic limps call especially for educational efforts. Occasionally surgery steps in beneficially with such simple procedures as tenotomy and tendon lengthening, but the intelligent use of corrective splints applied at night and careful education during the day produce good results. The common essential feature of most mechanical limps is shortening and the aim should be to correct, if possible, the mechanical error, which is producing the shortening rather than to disguise it by such a procedure as heightening the boot sole. This should only be done as a final stage in treatment and after all other errors, such as adduction, etc., have been corrected. If raising the boot sole is the only remedy adopted, it may lead to a progressive increase in shortening. Stiff limps generally call for little in the way of treatment. It is essential, however, that the part affected should be in the best possible position for subsequent ambulation.

Residual Vaccines.—A new technic for the preparation of residual vaccines is described by Jenkins which embodies the principle of Thomson's and Dean's methods. The term "detoxicated" he thinks, is unfortunately somewhat misleading and has even caused this type of vaccine to be looked on with a certain amount of suspicion. It has been thought that a preparation which is itself nontoxic cannot be expected to stimulate a protective reaction on the part of the tissue. If this were so, these vaccines might with reason be suspected. But they possess a toxicity of a definite type, and this toxicity is contained in the bacterial residue which remains after the complete removal of the toxins and endotoxins. Therefore Jenkins prefers to call them vaccines of the bacterial residue, or more briefly residual vaccines. The clinical results from the use of these vaccines are said to have been good especially in cases of uncomplicated chronic bronchitis.

Reducing Substance in Blood and Tumors.—While searching for further light on the problems of immunity, the Leytons tried the effect of transplanting in succession each of the endocrine glands to see if any one of them by their secretions caused or accelerated the growth of tumors. The only one that appeared to affect the growth of inoculated sarcoma in rats was the parotid. The blood sugar content of patients suffering from malignant disease was also investigated and the reducing substances invariably were increased. Further, in most of the cases which have been under observation for any length of time a definite excretion of sugar in the urine has appeared from time to time. So consistent have been the results that to rely on this test to differentiate between simple and malignant cases. The experiment of feeding rats on sugar after they have been injected with a bacillus with filtrable spores isolated from a case of human sarcoma was successful. Rats inoculated with the same culture, but not fed on sugar, showed no evidence of growth locally or in the lungs after three months. Six other rats fed on sugar, but not inoculated with bacteria, likewise remained healthy.

Indian Journal of Medical Research, Calcutta

July, 1920, 8, No. 1

Arthropods of Medical and Veterinary Importance in Mesopotamia and Their Relation to Disease: III. Bot Flies. W. S. Patton.—p. 1.
Indiana Calliphorinae: I. Chrysomyia Bezziana Villeneuve, Common Indian Calliphorine Whose Larvae Cause Cutaneous Myiasis in Man and Animals. W. S. Patton.—p. 17.
Passeromyia Heterochaeta Villeneuve in India. W. S. Patton.—p. 30.
Reproductive System of Cimex; Behavior of Spermatozoa. F. W. Cragg.—p. 32.
Bionomics of Houseflies: IV. Life-History of Musca. P. R. Awati. —p. 80.
Genitalia of Portchinsky's Species M. Corvina (Vivipara) and M. Corvina (Ovipara). P. R. Awati.—p. 89.
Progress Report on Surgery of Freshwater Gastropod Molluscs of Indian Empire and of Their Trematode Parasites. N. Annandale and R. B. S. Sewell.—p. 93.
*Correlation Between Chemical Composition of Anthelmintics and Their Therapeutic Values in Connection with Hookworm Inquiry in Madras Presidency: VI. Oleum Terebinthinae, J. F. Gaius, and K. S. Mhaskar.—p. 125.
Dilution of Reagents. W. F. Harvey.—p. 131.
*Value of Wassermann Test in Malaria. K. R. K. Iyengar.—p. 136.
Kala-Azar: I. Interim Report on Kala-Azar Work from 1917 to 1919. R. Knowles.—p. 140.
Id. II. Peripheral Blood in Kala-Azar. R. Knowles.—p. 162.
Id. III. Spleen Puncture Findings. R. Knowles.—p. 177.
Id. IV. Experimental Work and Possible Methods of Transmission of Kala-Azar. R. Knowles.—p. 186.

Therapeutic Values of Anthelmintics in Hookworm.—Healthy male prisoners were treated by Caius and Mhaskar with increasing doses of turpentine shaken with gum acacia emulsion and administered in two portions at half an hour interval. This treatment was preceded by an overnight dose of magnesium sulphate and followed by another dose of salts administered two hours after the second portion of the oil. No food was allowed until the bowls had moved. Occasional giddiness was noted with a 75 minims dosage of the highly resinified oil, while no toxic symptoms of any kind developed with a 180 minims dosage of the unresinified oil. In a series of seventy-nine cases treated with varying dosages of oil of turpentine, eleven hookworms were removed out of a total of 1,316. Moreover no ascarids were expelled, though roundworms were found present in twenty-five cases and whipworms in sixteen. Therefore, the authors conclude that oil of turpentine cannot be recommended as an anthelmintic.

Value of Wassermann Test in Malaria.—Iyengar examined the serum in eighty-our cases of undoubted malaria in adults and fourteen in children. Seven gave a positive Wassermann reaction. He concludes that malaria is not a cause of a positive reaction and quinin does not affect the Wassermann reaction.

International Journal of Psycho-Analysis, London

1920, 1, No. 2

Psychogenesis of Case of Female Homosexuality. S. Freud.—p. 125.
Primary Somatic Factors in Compulsive and Obsessive Neuroses. L. P. Clark.—p. 150.
Recent Advances in Psycho-Analysis. E. Jones.—p. 161.
Relation of Elder Sister to Development of Electra Complex. E. R. Mason-Thompson.—p. 186.
William Blake's Lyrics. J. W. Preger.—p. 196.
Three Notes. J. Riviere.—p. 200.
Symbolism of Being Run Over. E. Jones.—p. 203.
Ambivalence in Slip of Tongue. C. P. Oberndorf.—p. 204.

1920, 1, No. 3

Reaction to Personal Names. C. P. Oberndorf.—p. 223.
Reversal of Libido Sign in Delusions of Persecution. A. Stärcke.—p. 231.
Origin of Feeling of Persecution. J. H. W. Opbuijsen.—p. 235.
Case of War Shock Resulting from Sex-Inversion. C. W. S. Davies-Jones.—p. 240.
Dreams on Symbolism of Water and Fire. H. Flournoy.—p. 245.

Linguistic Factor in English Characterology. E. Jones.—p. 256.
Wish to be a Man. H. Sachs.—p. 262.
Instance of Care Needed in Drawing Conclusions. D. Bryan.—p. 268.
Revived Sensation Memory. B. Low.—p. 271.
Substitutive Memory. E. Jones.—p. 273.

Medical Journal of Australia, Sydney

May 21, 1921, 1, No. 21

Ether Anesthesia. F. L. Davies.—p. 413.
Anesthetic Notes. R. W. Hornabrook.—p. 415.
Gas-Oxygen Anesthesia. S. O. Cowen.—p. 416.
Rectal Anesthesia. R. Howden.—p. 418.
Modern Obstetrics: Case for Nature. F. Meyer.—p. 419.
Clinical Reports of Two Unusual Cases. G. Doyle.—p. 421.

May 28, 1921, 1, No. 22

Recent Advances in Diseases of Eye as Affecting General Practitioner. W. W. Hoare.—p. 435.
Recent Advances in Ear, Nose and Throat Specialty from Point of View of General Practitioner. R. G. Brown.—p. 437.
Huon Pine Oil. W. A. Harrison.—p. 440.
*A Broth of a Boy. C. H. E. Lawes.—p. 441.

Unusually Large Baby.—Lawes' patient had the following dimensions at birth: weight, 15 pounds; height, 21.5 inches; chest, 16 inches; head: occipito-frontal circumference, 15.5 inches; occipito-mental diameter, 6.09 inches.

Annales de Médecine, Paris

April, 1921, 9, No. 4

*Liver and Kidney with Gastric Ulcer. P. Le Noir et al.—p. 225.
Pleural Effusions with Induced Pneumothorax. F. Dumarest and F. Parodi.—p. 243.
Action of Thyroid and Parathyroids on Respiratory Interchanges. M. Labbé and H. Stévenin.—p. 264.
*Boveri Test of Spinal Fluid. G. Guillain and E. Libert.—p. 271.
Physicochemical Factors in Regeneration of Peripheral Nerves. J. Lhermitte.—p. 275.

Liver and Kidney Disease Secondary to Gastric Ulcer.—Extremely pathologic conditions in liver or kidneys or both were found in 5 patients who had died from three to eleven days after a successful gastro-enterostomy. There had been no appreciable symptoms to attract attention to liver or kidneys during life. These surprising experiences impelled Le Noir and his co-workers to apply functional tests to 43 other patients with gastric ulcer, and they found evidence of insufficiency of the liver by one or more of the tests in all of the 23 tested for alimentary glycosuria, coagulation time, digestion hemoclasis after ingestion of 200 c.c. of milk, and urobilinuria. Other causes for the liver impairment could be excluded, so that the defect in the stomach wall seemed to be the only explanation, especially as the insufficiency of the liver was most pronounced in the cases of long standing ulcers, and especially with ulcers on the most highly vascularized part of the stomach, the lesser curvature. Bleeding from the ulcer seemed to be more frequent, more intense and to last longer in the cases with impaired liver functioning. In 5 cases described in detail there was uncontrollable vomiting, liable to mislead to an operation for stenosis of the pylorus unless the signs of liver or kidney insufficiency were heeded. In 2 other cases what was supposed to be fatal operative shock was cleared up by discovery of unsuspected fatty degeneration of the liver. Operative shock may be merely the manifestation of an acute liver or kidney injury, the anesthetic the last straw breaking down the diseased organs. Dyspeptic coma with acidosis, and grave jaundice are the other forms in which this secondary liver or kidney disease may manifest itself in gastric ulcer cases. Among the practical deductions from these findings is the advantage of limiting intervention to gastro-enterostomy instead of resection in these cases with evidence that the liver or kidney or both are below par. Also that anesthetics which injure the liver should be avoided. Also the necessity for special care to ward off inanition acidosis when hematemesis compels restriction of mouth feeding. The most important lesson, however, is the necessity for not delaying the operation on the gastric ulcer until the liver is damaged beyond repair. The open ulcer in the stomach generates local septic complications, and allows the passage into the blood, and hence the arrival in the liver and kidneys, of foreign proteins on which the gastric juice has not had a chance to act. The resulting damage of liver or kidneys modifies the symptoms, the course and the prognosis of the gastric ulcer.

Boveri's Test of Spinal Fluid.—Guillain and Libert found a positive response to the Boveri test in every one of their forty subjects with various diseases whenever the albumin content of the cerebrospinal fluid was above the normal. It throws no light on the cause of the hyperalbuminosis. The test is made by pouring 1 c.c. of a 0.1 per thousand solution of potassium permanganate on the walls of a tube containing 1 c.c. of the cerebrospinal fluid. With normal fluid there is no change in tint; in pathologic conditions a yellow line appears at the junction of the two fluids, and on agitating the tube, the fluid turns a clear yellow.

Archives de Médecine des Enfants, Paris

April, 1921, 24, No. 4

*Hutinel's Cardiocirrhosis. J. C. Navarro (Buenos Aires).—p. 201.
*The Pretuberculous State in Children. P. Richard.—p. 215.
Gallop Sound in Two Children with Intact Kidneys. A. d'Espine.—p. 237.
Median Upper Hare-Lip. V. Veau and C. Ruppe.—p. 241.
Medical Treatment of Stenosis of Pylorus. J. Comby.—p. 244.

May, 1921, 24, No. 5

*Anemia in Infants. E. Weill and A. Dufourt.—p. 265.
*Osteitis Deformans. L. de Castro Freire (Lisbon).—p. 289.
Bilateral Hydronephrosis in Young Infant. Variot and Walter.—p. 297.
*Idiocy from Parathyroid Insufficiency. J. Comby.—p. 303.

Hutinel's Cardiocirrhosis.—Navarro recalls that various causes may be responsible for this association of heart and liver disease in children. Syphilis was undoubtedly a factor in the first of two cases he reports. The large liver and asystolia without valvular disease dominated the clinical picture in this child of 6. In the other case, the child of 10 was supposed to have tuberculous peritonitis. The liver and abdomen were much enlarged but the heart seemed to be normal. Necropsy after intercurrent pneumonia revealed the unsuspected degeneration of the heart. Each of the thirty times the abdomen had been tapped, an average of 10 liters of fluid had escaped.

The Pretuberculosis Stage in Children.—Richard reviews various ways and means to detect the soil on which tuberculosis is most liable to take root. Tuberculous parents transmit a demineralization diathesis to their children, and the latter are poorly nourished, as a rule, with low blood pressure, the blood showing high viscosity. Roentgenology supplements the clinical findings, and gives a basis for insisting on preventive measures. A combination of pituitary and suprarenal treatment often renders good service.

Anemia in Young Children.—Weill and Dufourt discuss the features that distinguish anemia from lack of iron, from injury or inadequate production of blood corpuscles, and from anemia from changes in the plasma. They discuss further the causes.

Deforming Fibrous Osteitis.—An illustrated description is given of a severe case of this kind in a man of 27. A previous report of the same case was published in the *Archives* ten years ago. The limbs and trunk have continued to shrivel and atrophy but the head has grown very large; the circumference now is 66 cm. while the total height is 118 cm. In this and in Riedinger's case, inherited syphilis may possibly be a factor.

Curable Idiocy of Parathyroid Origin.—Comby declares that evidence is accumulating to prove that an acquired idiocy of parathyroid origin is not uncommon. Fortunately it seems to differ from thyroid idiocy, myxedematous idiocy, in that it is amenable to parathyroid treatment. G. H. Clark has recently reported three cases of this kind. The apathy, tremor and convulsions recalled to his memory the effects of parathyroidectomy in animals, and suggested treating them with parathyroid extract. This was followed by prompt improvement in the young children. He published the cases recently under the heading "An Undescribed Condition of Infancy."

Médecine, Paris

May, 1921, 2, No. 8

*Early Diagnosis of Pulmonary Tuberculosis. L. Rénon.—p. 581.
*Vaccination of Cattle Against Tuberculosis. A. Calmette.—p. 590.
*Overlapping Asthma. F. Besançon and S. I. De Jong.—p. 592.
*Prophylaxis of Tuberculosis. L. Granjux.—p. 597.
Diagnosis of Pulmonary Abscesses. J. Chalier.—p. 601.

Technic for Artificial Pneumothorax Treatment. G. Kuss.—p. 603.
Indications for Sanatorium Treatment. L. Guinard.—p. 608.
Bronchitic Sowers of Bacilli. A. Pissavy.—p. 613.
*Preventive Heliotherapy. P. F. Armand-Delille.—p. 615.
*Examination of Sputum. A. Philibert.—p. 620.
Diagnosis of Tuberculosis in Infants. R. Debré.—p. 626.
*Acid-Resisting Bacteria. A. Vaudremer.—p. 631.
Iodin Internally in Treatment of Tuberculosis. H. Dufour.—p. 634.
*Diarrhea in the Tuberculous. P. Lassablière—p. 640.

Early Diagnosis of Pulmonary Tuberculosis.—Rénon concludes his review of the early diagnosis at different ages by advocating that legislation in all countries should command the only truly effectual means for the early diagnosis, that is, strict and compulsory bacteriologic examination of the sputum, in all cases.

Vaccination of Cattle Against Tuberculosis.—Calmette has been much encouraged with the results of inoculating calves with cultures of tubercle bacilli cultivated on a culture medium consisting of potato cooked in beef gall with 5 per cent. glycerin. Bacilli thus cultivated are only slightly virulent—small laboratory animals bearing them even by intravenous injection—but they confer a manifest resistance not only to natural infection but to experimental intravenous inoculation with violent bacilli. It is still a question how long this immunity lasts.

Asthma.—There are usually three phases in the course of asthma, first the paroxysms with long intervals, due to some local lesion which has influenced the localization of the disturbance, and later subsided. Then comes a period in which some respiratory infection invites the asthma again; it is less violent but more frequent, and there are attacks of dyspnea from the congestion in the air passages. The third stage is when heart and kidney disease entail further dyspnea, but this is usually labelled asthma, like the preceding phases.

Prophylaxis of Tuberculosis.—Granjux describes the workings of the Grancher system. It was described in THE JOURNAL, July 6, 1918, p. 1.

Preventive Heliotherapy.—Of all plants the human plant needs sunlight most. This is Armand-Delille's text, and he has been much gratified with the success of his "sun school." The children, with no clothing but trunks, left home at 8 a. m., each carrying his folding desk on his back, and under the leadership of the teacher sought in the fields and woods a place for the class, selecting different locations according to the wind, the heat and the sunshine. The mothers of the children in this school were all under treatment for tuberculosis in the sanatorium. In order to obtain such fine results as he records, the children have to be trained to live in the sunlight, exposing the body progressively. The main point is to accustom the skin gradually to the action of the sun. Such children acquire remarkable resistance to all physical agents, sleeping in winter with open windows and light bed clothing, and none of the children had colds during the winter. He adds that the effect already realized with these hundreds of children should encourage the application of this preventive heliotherapy as a stimulant for nutrition of all children, and especially for those in cities where conditions are so unfavorable to the physiologic development of the child.

Examination of Sputum.—Philibert urges the importance of homogeneization of sputum as the number of bacilli may be so small that they escape direct examination. He has found sodium hydroxid the most effectual solvent for the mucin. Centrifugation is greatly facilitated by reducing the density of the fluid by adding alcohol; this renders the fluid lighter than the bacilli, which aids in collecting the bacilli in the sediment. If no sputum is available, he gives an expectorant.

Acid-Resisting Bacteria.—Vaudremer relates that by cultivating tubercle bacilli in mediums free from glycerin they lose their acid-resisting properties, but acquire them again if glycerin is added anew. The resistance to acids thus seems to be traceable to the fats and carbohydrates which the tubercle bacillus has at its disposal.

Treatment of Diarrhea in the Tuberculous.—Lassablière calls attention to the efficacy of the treatment which he has applied to 142 patients. It consists solely in restricting the patients exclusively to sweetened condensed milk, diluted with four parts of rice water; 1 or 2 liters are taken during the twenty-four hours, a teacupful every two or three hours, with nothing else, fluid or solid.

Paris Médical

May 28, 1921, 11, No. 22

*Acidosis in the Pregnant. M. Labbé, J. Hutinel and F. Nepveux.—p. 421.
Ionometric Dosage in Radiotherapy. P. Schrumpf-Pierron.—p. 424.
*Spondylosis Versus Spondylitis. P. Modinos.—p. 429.

Acidosis in the Pregnant.—The woman developed unexplainable dyspnea, tachycardia, uncontrollable vomiting and other symptoms of acidosis at the seventh month of pregnancy. Sodium bicarbonate improved conditions temporarily, but emptying the uterus aggravated conditions. The woman died, and the microscope showed profound degeneration of the liver in both mother and fetus, while the other viscera were sound. In a second similar case the woman recovered. Such cases teach the importance of examining the urine for insufficiency of the liver in pregnancy disturbances.

Spondylosis and Spondylitis.—Modinos ranks rhizomelic spondylosis with osteomalacia and acromegaly, as a kind of trophoneurosis, an endocrine disturbance. It is in this direction that therapeutic efforts should be directed. He describes two cases in which everything else was tried but without avail. Spondylitis subsides under merely symptomatic measures.

Presse Médicale, Paris

May 28, 1921, 29, No. 43

*Fracture of Neck of Femur. C. Dujarier.—p. 421.
*Insufficiency of the Liver in Pregnancy. A. Crainicianu and M. Popper.—p. 424.
*Nongonococcus Ophthalmia Neonatorum. A. Cantonnet.—p. 426.
*Quinidin in Treatment of Arrhythmia. L. Cheinisse.—p. 426.

Fracture of Neck of Femur.—Dujarier has modified somewhat Delbet's method of driving a screw axially into the neck of the femur, and describes with ten illustrations, the exact technic as he applied it in eighteen cases under roentgen control. The results on the whole were incomparably superior to those obtained with the classic methods of treatment. Radiograms taken at regular intervals show that the bone pushes inward in time, the head of the screw finally protruding from the bone. Some of the patients walk without limping, but there is always some atrophy of muscles. It is less pronounced in those who exercised their muscles as ordered. All but one of the eighteen cases were fracture of the neck of the femur alone.

Pregnancy Insufficiency of the Liver.—The urine was examined daily and the test for digestion hemoclasis applied to ascertain the functional condition of the liver in forty-seven women with supposedly sound livers, a month or two before term. Retention of bile salts was found in 20 per cent. and of urobilin in 12 per cent. The digestion hemoclasis tests gave positive findings testifying to insufficiency of the liver in 33 per cent. Among the practical conclusions from the research are that choloroform should not be used for the pregnant, as it superposes further toxic action on the liver, and ether also had better be avoided.

Purulent Conjunctivitis in the New-Born.—Cantonnet found gonococci in only 18.5 per cent. of forty-two cases of purulent conjunctivitis in new-born infants since last October. In 12.5 per cent. ordinary micro-organisms were discovered, but in 69 per cent. the conjunctivitis seemed free from micro-organisms, although inclusions were found in the epithelial cells. These inclusions were encapsulated, and similar ones were found in the mother's vagina and in the male urethra. The conjunctivitis does not differ materially from that caused by gonococcus except that it develops later, not until the third to the twelfth day, and it lasts from fifteen to twenty days, and exceptionally up to six or eight weeks. Silver nitrate has no effect in warding it off, but can be used in treatment if the secretion is profuse. As it subsides, a 1 per cent. solution of zinc sulphate may be preferable.

Quinidin in Treatment of Arrhythmia.—Cheinisse reviews twelve recent French and German works on this subject. It is evident, he says, that quinidin can be counted on in certain cases to arrest the arrhythmia, and force it back into an earlier stage. But the day always comes, sooner or later, when the drug ceases to act, and the fibrillation will persist thereafter.

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June 1, 1921, 29, No. 44

*Tuberculosis of Glands in Cheek. C. Lenormant.—p. 433.
*The Blood During Spa Treatment. A. Grigaut et al.—p. 434.
*Serologic Tests in Surgical Tuberculosis. B. Fried and M. Mozer.—p. 436.

Tuberculosis of Glands in Cheek.—The genal glands may be scattered along the facial artery and vein, and the different groups may be the seat of acute inflammation or of a tuberculous process, as in a case described by Lenormant with illustrations. The treatment is that of tuberculous glands in the neck in general, only that a disfiguring scar would be of more moment in the cheek. All the cases he has encountered were in women. He has never seen a case of cancer originating in these glands.

Influence of Mineral Waters on Composition of the Blood.—The research here related was done during courses of treatment with the mineral waters of Contrexéville. The metabolic and other findings are tabulated from twelve of the eighty-nine cases studied. These waters are recommended for chronic nephritis and rheumatism, lithiasis, gout and obesity, and the benefit derived is explained in part by the drop in the cholesterin and the urea content of the blood, and the progressive change toward normal of the Ambard index of urea excretion. The latter is a reliable guide for conducting the treatment. Uric acid deposits are swept out into the circulation by the modifications induced by the mineral waters. This phase is followed by tardy elimination through the urine, and this can be accelerated by massage of muscles and other forms of physiotherapy under strict medical supervision.

Serologic Tests for Tuberculosis.—Fried and Mozer insist that tests for both syphilis and tuberculosis should be applied as the routine procedure to all serums sent in for examination. By this means incipient tuberculous processes in bone, joints, glands or lungs can be detected long before they are clinically manifest. In sixty-eight tuberculous children the reaction was positive in from 70 to 77 per cent. of those with a known tuberculous process in vertebrae, knee, hip joint, etc., of less than two or three years' standing, but only in from 26 to 34 per cent. longer than this. In grave cases with fistulas the reaction occurred less frequently. In 105 children with rachitis the percentage was only 7.5.

June 4, 1921, 29, No. 45

*Diazo Test for Bilirubin in Blood. A. A. Hijmans van den Bergh.—p. 441.
Vaccine Therapy of Colibacilluria. A. Mauté.—p. 443.
*Traumatic Separation of Skull Sutures. J. Murard.—p. 445.

June 8, 1921, 29, No 46

*Nature of "White Bile" A. Gosset, G. Loewy and Mestrezat.—p. 453.
*The Sympathetic Nervous System. P. Desfosses.—p. 455.

Bilirubin in the Blood Serum.—Van den Bergh states that continued experience with the test he published in 1913 has proved its reliability even in a concentration as low as 1:1,500,000, while no other substances give the same reaction with this diazo method. The rapid or delayed response shows further whether bilirubin in the blood serum is the result of obstruction or of impaired liver functioning. The reagent is made fresh with 25 c.c. of a 1 per thousand solution of sulphanilic acid; 15 c.c. of concentrated hydrochloric acid, and 0.75 c.c. of a 0.5 per cent. solution of sodium nitrite. The serum is treated with twice its volume of alcohol and the albumin centrifuged out. The supernatant fluid is taken up with a pipet and the reagent is added in the proportion of 25 per cent. by volume. The fluid turns red with a violet tinge in the presence of bilirubin. The test can be applied with as little as 0.5 c.c. of clear serum, or even 0.25 c.c.

Traumatic Separation of Skull Sutures.—Murard relates that callus is forming in the gap of 0.5 cm. where the coronal suture of the boy of 13 separated after a fall from a second story. Recovery was smooth, and the facial paralysis subsided by the third month. His review of the literature confirms the wisdom of trying to force the bones to close the gap, but this is a difficult matter. Possibly agrafes might aid.

White Bile.—In the three cases described, the cystic duct was completely obstructed, and the fluid found in the gallbladder was evidently the result of dialysis of the plasma, with no trace of bile salts or pigments. In each case the gallbladder showed fibrous degeneration.

The Sympathetic Nervous System.—This is the first of a series of special articles on this great *système de correlation* as Desfosses calls it, saying, "In man the heart beats, the lungs ventilate, the intestines digest, and the liver works—all solely for the purpose of providing for the brain a constant internal environment to supply it with energy. The only beneficiary of all this work that is done without its assistance *c'est notre intelligence.*"

Revue de Chirurgie, Paris

1920, 39, No. 11

*Enterostomy in Peritonitis. X. Delore and Conrozier.—p. 605.
*Chronic Occlusion of Duodenum by Mesentery. J. Leveuf.—p. 616.
Strangulated Prehernia Lipomas. J. P. Tourneux.—p. 653.

1920, 39, No. 12

Pressure in Cerebrospinal Fluid in Jacksonian Epilepsy. R. Leriche.—p. 679.
Circulation in Carotids After Ligation. Marquis and Lefeuvre.—p. 680.
Pathologic Physiology of Jacksonian Epilepsy. Wertheimer.—p. 695.

Enterostomy in Peritonitis.—Postoperative or other paralysis of the bowel entails peritonitis, but the danger is less from the peritonitis than from the bowel itself. In 22 such cases reported here, 12 of the patients were saved by the enterostomy. All died of the 7 with diffuse septic peritonitis, and one of the 3 with acute and rapidly spreading peritonitis. All recovered of the 4 with localized or circumscribed peritonitis, and all but 2 of 8 with peritonitis secondary to ileus. Any more extensive intervention would certainly have proved fatal, it is stated. In 2 of the cases, the enterostomy had to be repeated at another point before relief was obtained; in 1 case on the transverse colon, in another on the descending colon. A suture thread is run around the peak of the intestine drawn out, and this thread is drawn tight as the catheter is worked into the tip of the peak. As the catheter is pushed in, the wall is thus invaginated with it, protecting the mucosa against contact with the catheter. The ends of the thread are tied around the catheter and fastened to the abdominal wall.

Chronic Occlusion of the Duodenum from Compression by the Mesentery.—Leveuf concludes his study of this subject with the details of two cases, summarizing twenty-eight from the records. "If change of position and other medical measures fail, colopexy, with or without duodenojejunostomy, is indicated." In his first case the occlusion, of varying degrees, was of four years' standing and required entero-anastomosis. In the other case, of four days' standing, and it yielded to postural treatment.

Revue Franç. de Gynécologie et d'Obstét., Paris

January, 1921, 15, No. 11

*Pregnancies After Cesarean Section. P. Balard and J. Planès.—p. 437.
*Partial Symphysiectomy. R. Costa.—p. 445.
Complicated Old Salpingitis. G. Deverre.—p. 449.

Pregnancies After Cesarean Section.—Balard and Planès have compiled 419 cases of pregnancy after cesarean section; in 47 delivery proceeded spontaneously by the natural routes. The pregnancy continued to term in all but 2 or 3 per cent. of 319 cases, in which abortion occurred, and 7 per cent. of the women were delivered at the eighth month. Rupture of the uterus occurred in 2.5 per cent. of the cases, but 86 per cent. of the women in this group recovered and 50 per cent. of the children were saved. There is absolutely no way of telling whether the uterus is anatomically and functionally capable of standing the strain, and they insist that during the last month at least the woman should enter an institution, under close medical supervision. Spontaneous delivery should be waited for but it should usually be aided with forceps to prevent violent efforts. If anything suggests apprehension, the patient had better stay in bed after the uterus has reached a certain size.

Partial Symphysiectomy.—Costa cuts out the upper part of the symphysis when the stenosis is limited to the superior inlet only, with abnormally short true conjugate diameter. This partial symphysiectomy is free from danger of hemorrhage, and is so simple and easy, he says, that it can be done at any time during the pregnancy or in labor. It leaves a permanent depression, which definitely enlarges the pelvis. In the two cases in which he has applied this method, the

operation was done at the fourth month in one case, and the pregnancy proceeded unmolested. In the other case the stage of expulsion at term had lasted for four hours with no signs of progress. The true conjugate measured 8 cm. The contractions began again after the partial symphysiectomy, and in an hour and a half the child reached the perineum and was delivered in good condition. His experience indicates that this operation increases the true diameter from 2.5 to 3 cm. Another advantage, he says, is that the slant thus provided facilitates the mechanism of delivery, while there is nothing to interfere with the gait later or invite complications. "The rectus muscles are divided 1 cm. to right and left of the median line, just above the symphysis. Then the periosteum of the pubic symphysis is worked loose from the front and rear aspects of the symphysis down to half its height. Then with a long slender knife the bone and cartilage are cut away from above downward slanting back from the front down to half the height of the symphysis. . . . With a curet the surface can be scraped smooth. The posterior periosteum is not sutured with the rest. A slanting depression is thus left where the bone and cartilage have been cut out, thus enlarging the pelvis permanently to this extent. No illustrations accompany the description.

Schweizerische medizinische Wochenschrift, Basel

May 19, 1921, **51**, No. 20

Antagonistic Action of Calcium and Potassium. K. Spiro.—p. 457.
*Radium Treatment of Cancer of the Esophagus. G. Hotz.—p. 460.
Tuberculosis in Mountain Districts. A. Wolff-Eisner.—p. 461.
Nature and Origin of Scotoma Scintillans. J. Strebel.—p. 464.
Virus of Febrile Herpes. R. Doerr and A. Schnabel.—p. 469.

Radium Treatment of Cancer of the Esophagus.—Hotz extols the fine results he has obtained with radium treatment. The long and narrow applicator is swallowed to the correct depth, marked on the silk thread, and after the first eight-hour sitting the esophagus often becomes permeable for fluid foods. Applicators of progressive sizes are used, and roentgen exposures supplement the radium treatment. Exploratory excision has shown in a number of cases the complete cure of the cancer, as also necropsy of one patient. Roentgenoscopy also confirms the disappearance of the tumor. As soon as the course is completed, efforts must follow to prevent cicatricial stenosis. This is accomplished by the patient's swallowing a similarly shaped lead weight, nickel plated. The weights are from 4 to 10 mm. in diameter, and their weight and the active swallowing drives them slowly and harmlessly through the stenosis. The lumen was enlarged to 10 mm. in several of the cases, and the patients then refused further treatment, but these had to return later for correction of the stenosis. Each patient is given a set of these lead weights, and swallows them one after the other until one sticks. In case of hemorrhage, swallowing one of these weights arrests the bleeding by direct compression. He has been equally successful with radium in cancer of the pharynx and tonsils and pyriform sinus, but the interval since has not been over eighteen months in any instance. The danger of after-hemorrhage with cancer in the pharynx forbids the application of this method to outpatients.

Pediatria, Naples

May 1, 1921, **29**, No. 9

*Pneumococcus Peritonitis. U. Provinciali.—p. 385.
*Jacksonian Epilepsy from Ascaridiasis. L. Sironi.—p. 397.
*Infant Mortality at Messina. G. Bonfiglio.—p. 401.
Epidemic Encephalitis in Girl of Six. R. Spanò.—p. 413.

Pneumococcus Peritonitis in Children.—Provinciali suspected the pneumococcus infection from the herpes on the lips. The clinical picture otherwise was that of acute and grave peritonitis without known cause in a boy of 8 and girl of 9. The boy recovered after exploratory puncture had shown the pneumococcus, and a laparotomy had evacuated 2 liters of pus. The girl succumbed not long after the laparotomy revealing the purulent pneumococcus peritonitis limited to the lower abdomen. Nothing was found in either case demonstrating involvement of the lungs or tuberculosis, but the boy had a transient complicating pericarditis. This subsided with the peritonitis, the cure being complete in two months from the first symptoms. The sudden stormy onset of the peritonitis, herpes labialis, high leukocyte count, with polynuclears predominating, and negative serologic tests for typhoid and paratyphoid call for bacteriologic examination of the pus for pneumococci.

Jacksonian Epilepsy from Ascarids.—The girl of nearly 4 had been having the attacks in the left arm for ten days, recurring from one to four times a day. The child seemed otherwise normal, and the discovery of ascarids in the stools and a course of worm medicine were followed by a complete cure. Sironi theorizes that some relic of some infectious or toxic process in the brain had left a point of lesser resistance; the toxins from the helminths acting on this spot were responsible for the spasms in the region innervated from this point.

Infantile Mortality at Messina.—Bonfiglio states that while Naples has a death rate from infectious diseases of 4.92 per thousand, Messina's rate is 19.7. In every thousand deaths in Messina, 402.58 are of children under 5.

Crónica Médica, Lima

March, 1921, **38**, No. 693

Icterohemorrhagic Spirochetosis. J. Arce.—p. 65.
Hoover's Definitive Percussion of the Heart. J. B. Menéndez.—p. 75.

Semana Médica, Buenos Aires

April 21, 1921, **28**, No. 16

*Hypertrophy of the Prostate. F. Mastrosimone.—p. 445.
*The Diagnostic-Therapeutic Tuberculin Test. J. J. Vitón.—p. 473.
*Parabiosis for Research on Endocrine Glands. D. Rubinstein.—p. 477.

Hypertrophy of the Prostate.—Mastrosimone discusses from various standpoints the cases of hypertrophy of the prostate in which no operation should be attempted, those in which operative measures are imperative, and those in which they are optional. All the evidence, he says, is in favor of the transvesical technic, at one or two sittings, as the routine procedure, although occasionally subtotal perineal prostatectomy may be preferable, or even Bottini's intra-urethral electric cauterization. Under exceptional circumstances, Isnardi's resection of the vasa deferentia may prove useful. In conclusion he warns that the care before and after the operation often requires more attention and solicitude than with any other class of patients.

The Diagnostic-Therapeutic Tuberculin Test.—Vitón's success in treating latent and active tuberculosis with extremely minute doses of tuberculin has been repeatedly mentioned in these columns. He argues that occult, dormant and masked infection with the tubercle bacillus is extremely frequent, and that most of the infections in adults are merely the transient flaring up anew of this infection acquired in early childhood. This unsuspected latent bacillary infection has extraordinary consequences, but they have hitherto not been traced to their primary cause. By treating the manifestations with extremely minute doses of tuberculin, the primary infection is benefited, and as this factor in the clinical picture disappears, the rest of the symptoms generally become attenuated or vanish likewise.

Parabiosis for Study of Factors Affecting Growth.—With parabiosis induced, for example, by suturing side to side two puppies from the same litter, if the hypophysis of one is removed, the hypophysis of the other will hypertrophy. This puppy, by the end of the year, will show the effects of excessive hypophysis secretion, while the other puppy will show the effects of inadequate secretion.

Siglo Médico, Madrid

May 14, 1921, **68**, No. 3518

*Manifestations of Arteriosclerosis in the Eye. E. Fuchs.—p. 453.
*Suture for Herniotomy. J. Blanc Fortacín.—p. 457.
Decortication of the Lung. Idem.—p. 458.
Share of Syphilis in Epilepsy. C. A. Bambarén.—p. 460. Conc'n No. 3519.

Manifestations of Arteriosclerosis in the Eye.—Fuchs expatiates on the numerous lesions in the eye and the optic nerve for which arteriosclerosis may be responsible, and the importance of detecting them as an aid to the early diagnosis of arteriosclerosis, especially of the brain, and of nephritis, diabetes and syphilis. There is usually a history of slight hemorrhage in the retina at some time in cases of fatal apoplexy. He has never found the internal carotid or the

ophthalmic artery normal at necropsy after 70. Syphilitic arteritis is always accompanied with a lymphocyte infiltration of the wall of the vessel at various points, while senile arteriosclerosis is merely a degenerative process. He has found isolated foci of atrophy in the optic nerve after 70. These foci are strung along the nerve from the chiasm to its entrance into the eye, and he gives four photomicrograms of these findings, saying that they have never been described before.

Suture After Herniotomy.—Blanc has had so many unfavorable experiences with catgut at herniotomies that he has abandoned it almost completely with these operations. His technic for coaptating extensive surfaces is shown in two sketches. The first layer is sutured with silkworm gut, two needles working separately from the ends of the incision, for a femoral hernia for example. The outer end of each thread is tied over a small segment of rubber tubing; the other ends are brought out through the skin near the middle and tied together. After replacing the spermatic cord, the aponeurosis is sutured above it in a zigzag suture from each end of the incision. Eight or ten days later he removes the silkworm gut by cutting it each side of the central knot and pulling on the outer ends. The coaptation realized by pulling thus on each end of each suture on each plane is exceptionally firm.

Tohoku Journal of Experimental Medicine, Tokyo

May 3, 1921, **2**, No. 1

*Effect of Ergot on Hemoptysis. M. Maeda.—p. 1.
*Hyperglycemia and Glycosuria in Frightened Rabbits. I. Fujii.—p. 9.
Agglutination of Typhoid Strains. K. Aoki and T. Konno.—p. 65.
*Intravenous Alcohol Anesthesia. K. Nakagawa.—p. 81.

Effect of Ergot on Hemoptysis.—Maeda explains the contradictory effect of ergot on pulmonary hemorrhage by the contraction of the bronchial muscle which it induces, with a secondary increase in the blood pressure in the lung. (In English).

Hyperglycemia and Glycosuria in Frightened Rabbits.—Fujii gives details of the results of research on the sugar content of the blood in the urine of eighty-three rabbits fastened to the experiment table, with and without division of the splanchnic nerve. There is always a rise in the sugar content of the blood as the rabbit is fastened to the operating table. It reaches its height in three to six hours, and this *fesselungshyperglykämie* is accompanied by glycosuria, as a rule, and the amount of chromaffin substance in the suprarenals becomes reduced. These effects are less pronounced when the animal is protected against chilling.

Intravenous Alcohol Anesthesia.—Nakagawa gives the details of experiments with forty-eight rabbits and five dogs in which general anesthesia was induced by injection of a 5 to 15 per cent. solution of alcohol directly into the vein. About 4 or 5 c.c. of alcohol per kg. was required; the breathing continued tranquil, and no pathologic changes were found in the animals dying soon after. The anesthesia allowed surgical intervention with convenience, but complete anesthesia was late in developing and persisted longer than with ether. Satisfactory results were obtained with a mixture of alcohol and ether in saline, infusing 2.2 c.c. of alcohol and 1.4 c.c. of ether per kg. at the rate of 4 c.c. of the 10 per cent. solution per minute; the anesthesia could be maintained with only 0.8 c.c. of the solution. It began the eighteenth minute and could be kept up for forty minutes.

Archiv für Kinderheilkunde, Stuttgart

April 16, 1921, **69**, No. 3-4

*Increase of Helminthiasis in Children. J. von Gottberg.—p. 161.
*Etiology of Infectious Diseases. A. Tobeitz.—p. 185.
Hematology of Varicella in Infants. G. Baer.—p. 198.
*Influence of Reaction of the Food. Gertrud Baumgardt.—p. 209.
Gastric Digestion in Infants. H. Davidsohn.—p. 239.
*Serotherapy of Scarlet Fever. P. Bode.—p. 256.
Bacillary Dysentery in Children. P. Schulte-Bascho.—p. 269.
Suppurative Parotitis in the New-Born. W. Plewka.—p. 279.
Pseudotetanus and Identity of Forms of Tetanus. G. Kaulen.—p. 284.

Helminths in Children at Bonn.—Gottberg found ascarids in 40 per cent. of 200 schoolchildren examined during 1919; the trichocephalus in 4 per cent. and oxyurids in 32 per cent. Thus a total of 62.5 per cent. were infested. None of the children seemed to have any disturbance from their helminthiasis. He compares his figures with those in other cities and countries.

Etiology of Infectious Diseases.—Tobeitz is convinced that, besides the direct transmission of bacteria from person to person, there must be other factors, individual or external, which explain the onset of an infectious disease. That it is not the bacteria alone is amply demonstrated, he asserts, by the comparative infrequency of hospital contagion although the close crowding and other factors would seem to invite it. He is chief of the infectious department of the Graz public hospital, and gives the figures in regard to hospital contagion of the principal infectious diseases there. Another argument is the development of scarlet fever after a burn, which he has repeatedly had occasion to observe, in the absence apparently of all sources of contagion. He assumes a facultative autogenesis, and deplores that conditions in man and animals are so widely diverse that this is one of the problems that cannot be settled by experimental research.

Relation Between Bases and Acids in the Food.—Baumgardt discusses the effect which changes in the reaction of the food can exert on the transformations of matter and energy in children. The metabolic findings compared with the acid or alkaline reaction of the food are tabulated as determined in four healthy boys between 11 and 13 kept apart from other inmates of the orphan asylum. The alkalinity of the blood and the mineral content of the body showed no changes under extreme artificial alkalinization or acidification of the ordinary food of the institution.

Serotherapy of Scarlet Fever.—Bode injected intramuscularly 30 scarlet fever patients with about 60 c.c. of convalescents' serum, and reports defervescence with a crisis in 9 in less than twenty-four hours; remissions in 4, rapid lysis in 6, and remissions plus lysis in 11. The effect on the temperature of the injection was pronounced in every case, and no less surprising, he says, was the effect on the general condition, the children dropping to sleep after a few hours, sometimes in the midst of wild delirium, and waking with their minds clear. One boy of 12 with convulsions had no return of them after the injection. The circulation improved likewise, but the eruption was not modified nor complications warded off. The serotherapy has a purely antitoxic action.

Archiv für klinische Chirurgie, Berlin

March 21, 1921, **115**, No. 3

*Neuropathic Joint Affections. O. Hildebrand.—p. 443.
*Operative Treatment of Hypernephroma. E. Michaëlsson.—p. 494.
*Cholelithiasis and Achylia. F. Rydgaard.—p. 511.
Displaced Horse-Shoe Kidney. Raeschke.—p. 531.
*Hernia on Linea Alba. F. Mandl.—p. 537.
Complications of Perforated Gastric Ulcer. H. Steindl.—p. 562.
Excision of Edges of Wounds. L. Schönbauer and H. Brunner.—p. 581.
Hypertonic Saline in Treatment of Wounds. H. Landau.—p. 621.
Traumatic Pseudohydronephrosis. E. Picard.—p. 636.
Intestinal Functioning Under Experimental Intravenous Vaccine Therapy. O. Orth.—p. 644.
Anatomy of Stomach Arteries. L. Hofmann and K. Nather.—p. 650.
*Postoperative Thrombosis and Pulmonary Embolism. A. Rupp.—p. 672.
*Localization of Pulmonary Embolism. A. Rupp.—p. 689
*Resection of Parasitic Monster. F. Franke.—p. 691.
Correction of Displaced Canthus. J. F. S. Esser.—p. 704.
Anatomy of Vessels of Dura Mater. R. Demel.—p. 714.
*Stomach Behavior in Cholelithiasis. C. Rohde.—p. 727.
Fistula Between Esophagus and Trachea. E. Picard.—p. 744.

Neuropathic Joint Disease.—In all Hildebrand's research he has never found any evidence that cerebral paralysis is able to induce changes in joints such as we find in tabes and syringomyelia. But injury of peripheral nerves entailed identical changes of an extreme type in two cases described, and he theorizes to explain the mechanism of this as the consequence of vasomotor derangement. One of the cases was an actual neuromatous elephantiasis of one leg, for which spina bifida was responsible. The patient was a man of 33; talipes developed at the age of 3, and paralysis of that leg at 25. Healing after an operation on a neuropathic joint affection is liable to be defective; in tabes the bones show but scant tendency to repair.

Hypernephroma.—Michaëlsson analyzes thirty operative cases of hypernephroma with seven surviving from four to

fifteen years to date. The youngest of the patients was 34 at the time of the operation, and the group of survivors includes one man now 74. Even microscopic evidence of nonmalignancy does not guarantee against malignant recurrence, although this is not inevitable.

Achylia in Cholelithiasis.—Rydgaard found achylia in 47.4 per cent. of 158 operative gallstone cases in Rovsings' service since 1907. He tabulates similar data from other clinics, the whole showing achylia in 34.4 per cent. of 471 operative cases, and hypochylia in 17.6 per cent. Gastric secretion was normal in only 27 per cent. of the 26 male gallstone patients and in 57.6 per cent. of the 132 women patients. Rydgaard's data confirm anew the wisdom of early operative treatment in cholelithiasis to arrest progressing secretory disturbance and ward off achylia. Achylia is almost certain to occur when there is incontinence of the sphincter papillae from gallstone obstruction of the cystic duct. If this sphincter keeps continent, gastric secretion is not modified. The experiences related testify further that it is better to save the gallbladder, as conditions after cholecystotomy may favor the restoration of normal gastric secretion. Fully 74 per cent. of the cases of obstruction of the cystic duct were accompanied by achylia. Reflex action explains the achylia from the irritating effect of the gastric juice passing into the duodenum without the normal neutralization by bile.

Hernia on Linea Alba.—Mandl discusses hernias along the median line as connected with ulcerative processes in stomach and duodenum.

Postoperative Thrombosis and Pulmonary Embolism.—Rupp found embolism or infarcts in the lungs in 5 per cent. of the 12,971 cadavers examined in eighteen years. The 22,689 operative cases during eighteen years were followed by fatal thrombo-embolism in 0.26 per cent., while 1.1 per cent. succumbed to this cause of the patients with internal diseases. Changes in the force and speed of the blood stream and injury of vessel walls are factors common to all the cases. The data impose the necessity for thorough preparation of the patient in respect to heart, lungs and kidneys before an operation, and scrupulous care to avoid any injury of vessels or chilling, etc., with measures to keep the blood circulating properly, including gymnastic exercising of the lungs by movements of arms and legs, heart tonics, massage, etc.

Localization of Pulmonary Embolism.—In 659 cases of pulmonary embolism the lower lobes were affected four times oftener than the upper.

Parasitic Monster.—The xiphopagus was of the epigastrius parasiticus type, the limbs and trunk well developed, but without a head or spine. The junction was from the navel to the sternum, and the connection was of soft parts and peritoneum which Franke severed, leaving ample skin flaps to cover the large defect. The child was only 2 days old at the time, and has developed apparently normally since, with scarcely a trace of the operation. This is the fourth successful case of an operation on a xiphopagus to be recorded, he says.

Behavior of Stomach in Cholelithiasis.—Rohde found normal gastric secretion in 25.81 per cent. of sixty-two operative gallstone cases and achylia in 45.77 per cent. In fully 74 per cent. of the cases there was deficient gastric secretion, and this was pronounced in 88 per cent. of the cases in which the bile passages had been obstructed. After removal of the gallstones or other operation, the achylia or hypochylia has persisted unmodified through the years in the twenty cases reexamined; only two show normal gastric secretion. He ascribes this gastric deficiency to the loss of gallbladder functioning, and expatiates on the manifold secondary disturbances from a diseased gallbladder. The common innervation of both bile apparatus and stomach explains the pains in the stomach with gallstones, and the frequent mistaken diagnosis of stomach disease in cholelithiasis. Adhesions and traction from the gallstone process modify both motor and secretory function. He urges as the routine procedure, cholecystectomy plus T drainage. Discovery of deficient gastric secretion may turn the scale for differential diagnosis of cholelithiasis.

Deutsche medizinische Wochenschrift, Berlin

May 19, 1921, 47, No. 20

Puerperal Eclampsia. W. Zangemeister.—p. 549.
Lipoid Antibodies and Wassermann Test. Much and Schmidt.—p. 552.
Persistent Severe Spinal Cord Injuries After Lumbar Anesthesia. A. Müller.—p. 553.
Artificial Pneumothorax in Treatment of Pleuropericarditis and Pleuritis Sicca. F. O. Hess.—p. 555.
Tetanus Following Ear Trauma. A. Seligmann.—p. 555.
Precipitin Reaction in Darkfield and Hanging Drop and Its Forensic Import. G. Strassmann.—p. 556.
*Pertussis Serum. G. Stern.—p. 557.
Paratyphoid and Symptoms of Tetanus. O. Bossert.—p. 558.
Combined Sachs-Georgi and Wassermann Reaction. Stühmer and Merzweiler.—p. 559.
Open Botalli's Duct with Hypertrophy of Left Ventricle. R. Gassul.—p. 559.
Radical Operation for Perforated Gastric Ulcer. Dewes.—p. 560.
*Nature and Treatment of So-Called Epicondylitis. Dubs.—p. 561.
Renal Hemorrhage. P. Schäfer.—p. 562.
The Chin-Shoulder Maneuver as a Prophylactic Measure to Prevent Asphyxia in Anesthesia. W. Kühl.—p. 563.
Abdominal Massage. A. Müller.—p. 563.
Effectiveness of the Most Common Stimulants Applied to the Hematopoietic Organs. G. J. Lührs.—p. 564.
Extension Apparatus for Crooked Fingers. L. Schmidt.—p. 564.
Interrelationship of Eye and Dental Disease. A. Gutmann.—p. 565.
Anorexia in Children. L. Langstein.—p. 566.

Pertussis Serum.—Stern reports the results of investigations undertaken to show the value of bovine serum injections in pertussis. He first demonstrated that injections of normal bovine serum had no effect on the course of pertussis. The serum of young bovines previously inoculated with vaccine was also frequently ineffective. Especially adapted smallpox strains must be employed, and the serum must be procured at just a certain time to prove effective. Beginning with smaller quantities, he found that 20 c.c. of the serum were required to bring about a distinct therapeutic effect. He injected usually 10 c.c. subcutaneously in each thigh of the children (also infants) and then prescribed rest in bed. After the injections fever ranging between 28 and 39.5 C. commonly rose but always receded within a few hours. No bad effects were observed. The benefit from the serum injections in some twenty cases was very marked. Either the coughing paroxysms were checked absolutely or the vomiting ceased and the coughing became less frequent and less intense. The duration of the disease was much shortened. In a few instances a second dose of 20 c.c. was given a week after the first, with prompt effect.

The Nature and Treatment of So-Called Epicondylitis.—Dubs says that there is no such thing as epicondylitis in the real sense of the word. The condition that goes by this name has nothing to do with the epicondyle. It is not associated with inflammation or any local change in the epicondyle. The real basis of the clinical symptoms of so-called epicondylitis is doubtless an isolated capsule injury of the humeroradial or the tibiofibular joint, the result of repeated occupational injuries which arise from the fact that certain maneuvers have to be carried out with the forearm flexed and supinated at the same time. From the standpoint of health insurance, such injuries cannot therefore be regarded as traumatic. A small proportion of the capsule injuries may, however, be the result of trauma and may arise from an isolated sprain of the humeroradial joint. By way of treatment, hot air and rest are most effective. The joint should not be immobilized, but the joint should be favored, and supinating and flexing movements involving the joint should be avoided. No heavy weights should be lifted. Healing is slow, but after four or five weeks patients may cautiously resume work.

Deutsche Zeitschrift für Chirurgie, Leipzig

May, 1921, 160, No. 5-6

Treatment of Pericecal Abscesses. K. Grieg.—p. 289.
*Resection of Stomach by Billroth II. W. F. Suermondt.—p. 299.
*Treatment of Infected Wounds. H. Hellendall.—p. 322.
*Fate of Fascia-Fat Flaps in Brain-Dura Defects. W. Koranecke.—p. 342.
*Tardy Rachitis. H. Sauer.—p. 356.
*Irradiation of Spleen in Prophylaxis of Hemorrhage. Kurtzahn.—p. 373.
*Local Temperature in Differential Diagnosis. E. Seitz.—p. 383.
Fracture of Both Sesamoid Bones of Big Toe. E. Müller.—p. 392.
*Projectiles Left in Thorax. W. Jehn and K. Mayer.—p. 398.
*Gastro-Enterostomy with Loop of Ileum. J. Dubs.—p. 424.

Billroth II and Its Results.—Suermondt has been able to trace to date eighty-two of 100 patients treated by resection

of the stomach for ulcer at the Leiden surgical clinic. The list includes twelve transverse resections, twenty by Billroth I and fifty by Billroth II. The present condition was ascertained by a test breakfast and the roentgen findings. The outcome is incomparably better in the Billroth II cases; the stomach empties itself more rapidly and more completely than with the other methods, and the patients have all gained materially in weight. The test meal showed normal findings in all but one case in which occult blood was found in the stools for which no explanation could be found. As the food passes more rapidly out of the stomach, there is less stimulus to production of gastric juice, which may partially explain the less tendency to hyperchlorhydria.

Treatment of Infected Wounds.—Hellendall describes his favorable experiences with a slight modification of the Carrel-Dakin solution technic.

Fascia-Fat Flaps for Brain-Dura Defects.—Koennecke comments on the conflicting views that prevail as to the best method for closing defects in the brain, reporting here the ultimate outcome in seven cases in which, three or four months after healing of the wound of the brain, he implanted a flap of fascia and fat taken from the rectus or thigh. The defect in the skull was closed from three to six months later. He has now a total record of ten cases of the kind, besides considerable experimental experience. The flap undergoes structural changes which adapt it still better for the purpose. The fat has retained its vitality, and the fascia become transformed mainly into connective tissue, with an abundance of elastic fibers.

Tardy Rachitis.—Sauer writes from Hamburg to describe twelve cases of rachitis developing in youths and young men, from 15 to 22, in the last three years, all with pains in the legs, difficulty in walking, especially in climbing stairs, curvature of long bones or spine, and cramps and tetany. Most of them had had rachitis in childhood but without deformity at that time. Severe tetany was manifest in six and in the others there were unmistakable signs of latent tetany. He calls attention to this coincidence of rachitis and tetany, urging further investigation in this line. One young man of 22 presented signs in addition indicating malfunction of the pituitary, suprarenals and parathyroids, but the tetany was the predominant symptom. Sauer theorizes that the parathyroids are mainly responsible for tardy rachitis, with a defective diet as the occasional cause.

Preliminary Irradiation of the Spleen to Prevent Hemorrhage at Operations.—Kurtzahn's experiments were negative in that exposure of the spleen to the roentgen rays before an operation did not prevent the usual large losses of blood. But it reduced small parenchymatous bleeding. To estimate the effect, he induced the patients to allow the removal of a rectangular piece of skin, 1 by 2 cm., under local anesthesia, with care not to cut down into the subcutis. As the scrap of skin was removed, a stop-watch was started, and the blood from the small raw area was mopped up with sponges applied just below the raw area on the thigh. The sponges were weighed beforehand and again at the end of the given period for the experiment, the difference showing the amount of blood that had been lost.

Local Temperature in Differential Diagnosis. — Seitz announces as the conclusion of tests on thirty women with salpingitis, a number with appendicitis, and healthy women, that the temperature in the vagina is higher with gynecologic inflammatory processes than with processes elsewhere, as compared with the temperature in the rectum. A higher vaginal temperature tends to incriminate an ovary or tube, while a higher rectal temperature points rather to the appendix. This difference is most instructive when it persists or is particularly striking, but the possible participation of the adnexa in the appendicitic process limits the significance of the finding. In one case stenosis in the upper rectum was traced to a parametritic process by the higher vaginal temperature when the symptoms and an excised scrap had suggested malignant disease.

Projectiles Left in the Thorax.—Jehn and Mayer report some cases in which the projectiles had been left in lung or chest wall as apparently doing no harm, but they suddenly roused a year or more later and induced fatal gangrene.

Gastro-Enterostomy with Loop of Ileum.—The anastomosis with a loop taken too low down on the bowel entailed profuse diarrhea, extreme emaciation, debility and other disturbances in the two cases reported by Dubs. He operated two or more years later to relieve the unbearable condition, and discovered that the preceding gastro-enterostomy, done elsewhere, had been done with the wrong loop by mistake. Conditions had been only aggravated by the intervention.

Jahrbuch für Kinderheilkunde, Berlin

1921, **94**, No. 6

*Idiopathic Hemorrhages in the Skin. L. F. Meyer and E. Nassau.—p. 341.
*Kidney Functioning in Infants. III. E. Stransky.—p. 361.
*Pseudohemophilia in Female Infants. H. Opitz and M. Frei.—p. 374.

Idiopathic Hemorrhages in the Skin.—Meyer and Nassau describe a hemorrhagic disease in infants and young children which does not fit into the frame of any known derangement of the blood or vessels. The minute extravasations in skin and mucous membranes occurred without known cause and without material disturbance of the general health. The article is based on over thirty-five cases, with from three to seven attacks of these minimal hemorrhages. The extravasations in the skin were mostly the size of a pinhead; sometimes they were raised a little above the level of the skin; at some points there were larger patches of extravasation but it never extended into the subcutis. A tendency to symmetrical arrangement was evident, and the suddenness with which the extravasations occurred was striking, as also their abrupt retrogression. They lasted from less than one day to eighteen days. The hemorrhages occurred also in mucous membranes, bladder and kidney, mouth, eyes and nose, but there was actual epistaxis only in one case. They regard this tendency to hemorrhages in the skin and mucous membranes as of the nature of scurvy, and advise systematic addition of more vitamins to the diet. Nearly 40 per cent. of twenty-eight of these children died later from pneumonia, anemia, tuberculosis or other intercurrent disease, suggesting a substandard constitution.

Kidney Functioning in Infants.—Stransky gave twelve infants urea, and he then recorded its elimination and the elimination of chlorids, spontaneously and under the influence of thyroid treatment and of treatment with theobromin, etc. Among the other findings is that infants eliminate urea better than others, the output per kg. being three or four times that of adults.

Pseudohemophilia.—The female infant of nearly 9 months had displayed a hemorrhagic tendency from birth, and had succumbed to the recurring losses of blood. The blood had not shown the least tendency to coagulate, and this was explained by the total lack of fibrinogen in the blood. Rabe and Salomon have reported a similar case, listing it as hemophilia, but Opitz and Frei reject this classification, saying that this sporadic absolute absence of fibrinogen places these cases in a class apart.

Mitt. a. d. Grenzgeb. d. Med. u. Chir., Jena

1921, **33**, No. 3

*Occupational Deformity of Hand. K. Pichler.—p. 249.
Chest Wall-Supporting Function of Lung. E. Becher.—p. 257.
*Air Embolism. W. Gundermann.—p. 261.
*Muscle Symptom with Chronic Appendicitis. N. Wolkowitsch.—p. 283.
Safety Precautions in Transfusion of Blood. K. Behne and K. Lieber.—p. 291.
Shock. H. Knorr.—p. 326.

Deformity of Hand from Work.—Pichler refers to the slanting outward of the fingers in persons who have done much hard work. This shape of the hand is common with old articular rheumatism and in gout, but manual labor, such as carpenter work, is liable to induce it in the healthy.

Air Embolism.—Gundermann's experiments on dogs demonstrated that a small amount of air that does no apparent harm in the right heart kills infallibly when in the left heart. The foam churned up gets into the minuter vessels of the heart and blocks them, with consequent arrest of the heart. The millwheel distance murmur, the *mühlengeräusch*, with

contusion or other injury of the chest, can be accepted as pathognomonic for air embolism in the right heart. Air in the left heart kills before the sound can become apparent. Air embolism always occurs through a vein, and the lung acts as a filter to prevent the passage of air from the right into the left heart. We can ward off danger of air embolism into the right heart by postural measures, but we have no means of warding it off from the left heart. If air embolism has occurred, we must stimulate the heart action with all our energies. With death from air embolism there is no recourse, as all our measures are unable to restore function to the left ventricle. In conclusion he warns to have necropsy follow the death as soon as possible.

The Muscle Sign of Chronic Appendicitis.—Wolkowitsch has found the abdominal wall muscles abnormally relaxed, especially on the right side, in cases of chronic appendicitis. The muscles seem to have shrunk and to have grown less elastic. This is in marked contrast to acute appendicitis. With a tonometer it is easy to determine the difference in the tonus of the muscles on the two sides.

Münchener medizinische Wochenschrift, Munich

April 15, 1921, **68**, No. 15

Causal Treatment of Arteriosclerosis. E. Heilner.—p. 443.
Classification of Pulmonary Tuberculosis Cases. Fraenkel.—p. 445.
Pathogenesis of Catatonic Stupor. H. Berger.—p. 448.
Is Friedmann's Tuberculosis Treatment Specific? Rietschel.—p. 450.
Epidemic Encephalitis in Children. Progulski and Gröbel.—p. 451.
Symptoms of Meningitis in Early Stage of Syphilis, Under Arsphenamin Treatment. E. Jaffé.—p. 454.
Modified Operation for Flatfoot. A. Wachter.—p. 456.
Red Blood Corpuscles in Darkfield Illumination. A. Dietrich.—p. 457.
Addendum to My Article on Hoffmann's Darkfield Method. E. Keining.—p. 458.
Filter for Deep Roentgen Therapy. Baumeister.—p. 458.
Rupture of Aorta. H. Schöppler.—p. 459.
Late Intubation and Tentative Extubation. J. Trumpp.—p. 460.
Congenital Lateral Fistulas of the Neck. Griessmann.—p. 460.
Treatment of Eczema. L. von Zumbusch.—p. 461.

Wiener klinische Wochenschrift, Vienna

May 12, 1921, **34**, No. 19

Vagus Involvement and Gastric Ulcer. G. Holler.—p. 223.
Hypernephroma. K. Gagstatter.—p. 225.
Local Effect of Dimethylsulphate. J. Bodenstein.—p. 226.
Intravenous Therapy; Hypertonic Solutions. J. Bauer.—p. 229.

Zeitschrift für Tuberkulose, Leipzig

April, 1921, **34**, No. 1

*Influence of Food on Tuberculosis Mortality. H. Selter and Nehring.—p. 1.
*Tuberculosis in the Young. F. Ickert.—p. 7.
Constitutional Anomalies in the Tuberculous. K. Eichwald.—p. 17.
Partial Antigens in Treatment of Tuberculosis. H. Feibes.—p. 29.
*Allergy to Tuberculin. K. Dietl.—p. 38.
Official Measures Against Bovine Tuberculosis. H. Haupt.—p. 43.

Influence of Food on Tuberculosis Mortality.—Selter and Nehring present tables which confirm the decline in mortality from tuberculosis as conditions in respect to food have improved in the last two years. Their tables show further that the highest peak of mortality is generally in the first months of summer. They explain this as the result of the poorer quality of the food toward the close of winter, when the vegetables, etc., have been kept so long that their vitamin content is low. As soon as fresh vegetables come into the market, the mortality drops, and it is lowest in the fall. Their charts show that the question of food is more important even than the housing question, although the housing question, they remark—the overcrowding in the cities—has in many places reached an actually frightful stage.

Tuberculosis in the Young.—Ickert analyzes the conditions in regard to tuberculosis at Stettin during the last ten years, comparing them with similar figures from other German cities and Holland. During the war the mortality from tuberculosis among young children increased by 100 per cent.; in school children only by 50 per cent.; between the ages of 15 and 20 it increased by 200 per cent. The infants suffered from the mothers becoming wage-earners, and the youths from their becoming wage-earners themselves. Fully 62 per cent. of the tuberculous youths were known to have a familial taint. His figures confirm the great tendency toward healing of tuberculous processes during the school age. They show further the necessity for guarding youths with special care, but above all, he declares, the protection against familial contagion of the younger children is the alpha and omega of the fight against tuberculosis.

Allergy to Tuberculin.—Dietl has collected various data bearing on the general and continuous allergy to tuberculin. They suggest that the protecting function of the skin in the fight against tuberculosis has not been appreciated to the full. A lively allergy on the part of the skin is not only a sign of the presence of large quantities of antibodies but it is a sign of a vigorously functioning skin organ. We are justified, he asserts, in ascribing an important rôle to the internal-secretion function of the skin organ; like all the endocrine glands, it is able to exert an action on distant organs, and thus may reenforce the lungs in their struggle against the disease.

May, 1921, **34**, No. 2

*Pulmonary Tuberculosis in the Aged. W. Stephan.—p. 81.
*Tuberculin Treatment. A. Offrem.—p. 94.
*Urine Test for Tuberculosis. E. Liebhardt.—p. 99.
Apparatus for Artificial Pneumothorax. R. Lubojacky.—p. 102.
Artificial Plus Spontaneous Pneumothorax. H. Maendl.—p. 105.
Recent Treatments of Tuberculosis. G. Schröder.—p. 107.

Pulmonary Tuberculosis in the Elderly.—Stephan analyzes his experience with pulmonary tuberculosis in 338 men and 138 women over 40 years of age. The early emaciation and anemia and absence of fever in the elderly may mislead the diagnosis. Low blood pressure is also a special feature of tuberculosis in the elderly. The blood pressure is an important aid in differentiating tuberculosis from other diseases of the lungs after 40. Sclerosis of the kidneys may be responsible for the hypertrophy and dilatation of the left ventricle often noted in chronic pulmonary tuberculosis in the elderly. The tuberculous process in the lung also shows a special tendency to fibrous processes.

Tuberculin Treatment.—Offrem explains the tuberculin reaction as a consequence of the disproportion between the amounts of antigen and of antibodies. This entails the production of anaphylatoxic substances, and these induce the fever and general and focal reaction. The logical conclusion is to give more of the antigen, that is, of the tuberculin to induce production of an excess of antibodies. He describes a few cases to show the benefit from this. In one young man, for instance, the tuberculin treatment caused depression, headache, and slightly febrile temperature, but at the fifth injection the amount was increased from 0.1 to 0.7 c.c. and at once all subjective symptoms subsided and the temperature kept persistently normal.

Urine Reaction in Tuberculosis.—Liebhardt applied the urine test in fifty-one cases, and confirms that there is a specific reaction with active tuberculosis, but says that it is so slight and so inconstant that he does not ascribe much importance to this own-urine test by Wildbolz' technic.

Zentralblatt für Chirurgie, Leipzig

May 14, 1921, **48**, No. 19

Traction Diverticulum of Duodenum. Hofmann and Kauffmann.—p. 653.
Sacral Anesthesia in Difficult Cystoscopy. H. Brütt.—p. 653.
*Fatal Hemorrhage After Puncture of Spleen. Wohlgemuth.—p. 655.
*Treatment of Paronychia. A. Schlesinger.—p. 656.

Fatal Hemorrhage Following Puncture of the Spleen.—Wohlgemuth states that in various affections of the spleen (abscesses, hydatid and other cysts, tumors) many authors practice and recommend puncture of this organ for diagnostic purposes. There are few references in the literature to the danger of serious hemorrhage after puncture of the spleen. He therefore reports this fatal case. A young woman, aged 26, had been admitted to the surgical ward with the tentative diagnosis of a subphrenic abscess on the left side. A diagnostic puncture beneath the left costal arch in the anterior axillary line was made. No pus was aspirated, and only a small quantity of blood, containing hemolytic streptococci. After the puncture the patient showed signs of weakness; the pulse was small and thready; the extremities began to get cold and pale, and death ensued at the end of ten hours. At necropsy the abdomen was found to contain 2,500 c.c. of blood, partly coagulated and partly in a fluid state. The

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blood was for the most part in the small pelvis and in the region of the spleen. On the lateral side of the spleen there were three puncture injuries about 1 cm. apart. The splenic pulp showed signs of sepsis, and pea-sized abscesses were scattered through the left kidney. From the three small puncture holes in the spleen, 2½ liters of blood had escaped into the abdominal cavity within a few hours. In this case the puncture of the spleen was accidental, but in any event when the left subphrenic space is punctured, the possibility of striking the spleen must be taken into account. Therefore, Wohlgemuth concludes: puncture of the spleen through the abdominal walls is not advisable, mainly because of the danger of hemorrhage, but there are other dangers; in the presence of septic affections puncture of the spleen is especially dangerous; if the spleen has been punctured, either intentionally or by accident, the patient should be carefully watched for the next twenty-four hours, so as to take the proper action if there are any signs of hemorrhage.

Treatment of Whitlow.—Schlesinger has found that if in whitlow of the finger the whole nail, or in case of a lateral starting point, even half of the nail, is removed, an unpleasant condition arises, specially for patients who have to use their fingers for delicate work, because of the resulting sensitiveness of the matrix. For some time past he has prevented this condition by removing only the central portion of the nail, the root, if the starting point was centrally located. With the shears he cuts into the nail on one side a little peripherad from the root; he cuts the nail transversely to the other side, holding the shears somewhat slantingly; and with the pinchers he grasps the root and removes it with a twisting motion. If, as often happens, the suppuration begins near the root, it is not necessary to remove more than the root, even though the suppuration has extended some distance peripherad. Even though almost the whole nail is loosened though suppuration, the body may usually be preserved for a time, until it is gradually replaced by the new nail. Patients are able to use the finger sooner and the healing process is much shorter than as if the whole nail were removed.

Zentralblatt für Gynäkologie, Leipzig

May 7, 1921, **45**, No. 18

Effect of Pregnancy on Cancer of the Uterus. A. Mayer.—p. 629.
Rupture of Uterus in Diverticulum Pregnancy. M. Müller.—p. 638.
*Free Autoplastic Peritoneal Grafts. H. Fuchs.—p. 643.
Diagnostic Value of Vaginal Smear Cultures. Lehmann.—p. 647.

Autoplastic Peritoneal Grafts in Gynecologic Operations.—Fuchs relates his experiences with unpedunculated grafts of peritoneum to cover defects in the peritoneum or reenforce a suture, instead of drawing down omentum for this purpose. Omentum contains adipose tissue and it does not belong in the gynecologic area. Furthermore, resection of omentum not infrequently entails embolism in the intestinal vessels, and there is the well known tendency for adhesions to develop. Experiments on animals had shown conclusively that transplanted peritoneum became actually incorporated with the receiving tissue, and was not merely replaced by growing connective tissue. The tissue character of the transplant seems to be fully preserved. He describes several cases in which he has used free peritoneal grafts with success in gynecologic practice. While admitting that, owing to the fewness of his clinical cases, his experience can be regarded only as stimulative, he thinks the procedure might possibly be further developed to advantage.

May 14, 1921, **45**, No. 19

A Case of Placenta Diffusa. R. Kapferer.—p. 661.
Remarks on Iso-Agglutination. K. Landsteiner.—p. 662.
*A Rectovesical Plus Rectovaginal Fistula. H. R. Schmidt.—p. 665.
Extravesical Opening of Nonsupernumerary Ureter. Puppel.—p. 667.
Abdominal Route in Operation on Vesicovaginal Fistulas Difficult of Access. C. U. von Klein.—p. 672.
Bladder Stone as Hindrance in Childbirth. Ebbinghaus.—p. 676.
Fistula of the Posterior Cervix Wall. G. Seiss.—p. 679.
*Turpentine Treatment in Puerperal Sepsis. A. Hermstein.—p. 683.
Turpentine Injections in Adnexa Affections. C. Hartog.—p. 686.
Symphyseotomy Versus Cesarean Section. F. Engelmann.—p. 689.
Criticism of "Nerve Changes in Eclampsia." T. Fahr.—p. 690.

Operative Correction of a Rectovesical Plus Rectovaginal Fistula.—Schmidt describes a remarkable case from the Bonn Woman's Hospital. In a girl of 8 part of the feces had passed through the vagina since the child was 3 years old, according to the mother's statement; another portion of the feces passed with the urine through the bladder. A safety pin had been found in the vagina when the child was a year old, and Schmidt assumes that it must have been in the bladder first, and passed thence to the rectum and escaped from there into the vagina, leaving residua of peritonitis in its track. From the vagina fecal matter was oozing and on catheterization dark-colored urine mixed with gas and feces was evacuated from the bladder. A longitudinal slit, 1.5 cm. long, led directly from the posterior vaginal wall into the rectum. Through the rectum a second roundish opening was discovered 10 cm. from the rectovaginal fistula, at the level of the upper edge of the symphysis. A curved sound was passed from the bladder into the rectum. The eczema was allowed to heal and the rectovesical fistula was closed through a laparotomy. Adhesions between the flexure, uterus and pelvic wall were either loosened or divided. Two slits in the large intestine from 2 to 3 cm. long resulted and through one of these the fistula was located, and the bladder separated from the rectum. The fistula and the tears in the intestine were closed by button-hole sutures. The closed tube on the right side was removed and the abdomen was closed without draining. The second operation to close the rectovaginal fistula was not done until six weeks later. Normal relations are restored and the child is perfectly healthy, the urine being clear and containing no pathologic material.

Turpentine Treatment in Puerperal Sepsis.—Hermstein reports his experience with turpentine and camphor in the treatment of thirty cases of septic puerperal infection. Following the example of Wederhake, who highly recommends turpentine and camphor in the treatment of staphylococcus and streptococcus infections, he injected 1 c.c. of a 20 per cent. solution of turpentine in olive oil with 0.2 gm. of procain under the periosteum of the iliac fossa. Of the thirty patients, twenty-four showed more or less pronounced symptoms of puerperal sepsis. He saw no evidence of a remarkable effect such as Wederhake and Zöppritz describe. There was no improvement in the general status, nor in the appetite. The chills did not abate; the icterus did not disappear; the heart became weaker and weaker, and death ensued: in seven cases after the first injection, in six, after the second; once after the third, and once after the seventh, the period of treatment extending over from two to forty-seven days. In nine cases ending in recovery, there was no drop in the high temperature even after two or three injections. Defervescence did not occur for two or three weeks, and then only by lysis with occasional exacerbations. In four of the remaining six patients the temperature (as high as 40.2 C. in the evening) suddenly fell to normal the second day after an injection. This phenomenon was so surprising that he was beginning to regard it as a possible effect of the treatment, but doubts arose when in one case after three days of normalcy the temperature shot up to 39 and even 39.9 C. but three days later dropped spontaneously just as another turpentine injection was about to be given.

Nederlandsch Tijdschrift v. Geneeskunde, Amsterdam

April 16, 1921, **1**, No. 16

Present Status of Vaccine Therapy. C. H. H. Spronck.—p. 2116.
*Vitamins. E. C. van Leersum.—p. 2137.
*Chronic Arsenic Poisoning. M. Elzas.—p. 2154.
Vaccine Prophylaxis of Typhoid. L. Schaap.—p. 2158.

Vitamins.—Van Leersum reviews the research on accessory food factors in America, saying that on his recent trip to America "the rat colonies where vitamins are being studied, were my principal objective." "And what I saw of Donaldson's work at Philadelphia, McCollum's at Baltimore, Hart and Steenbock's at Madison, and Osborne's at New Haven, to mention only a few, far surpassed my anticipations." He describes their methods, and remarks that a standard rat cage for scientific research should be imposed by international agreement, as exercise is necessary for the rats.

Chronic Arsenic Poisoning.—Elzas recalls De Haas' numerous cases of optic neuritis in which arsenic was found in the urine, and says that the reason why others do not report

this coincidence oftener is because no one thinks of examining the urine for arsenic in cases of optic neuritis. The necessity for more frequent examination for arsenic poisoning has been impressed on him anew by the recent death of a man of 30, healthy until 1918, when he developed polyneuritis, edema and an eruption, and 0.0005 gm. of arsenic per thousand was found in the urine. He died six months after he had married and had his house repapered, and 3 mg. of arsenic per square meter was found in one of the wall papers.

Acta Chirurgica Scandinavica, Stockholm

April 20, 1921, **53**, No. 5

*Peritoneal Pseudomyxoma. E. Michaëlsson.—p. 441.
*Resection of Calcaneum. S. Johansson.—p. 466.
*Local Eosinophilia. P. Kühnel.—p. 476.
War Wounds of Knee. W. Körte.—p. 514. (In German.)

Peritoneal Pseudomyxoma.—Michaëlsson describes (in French) with seven illustrations four cases of pseudomyxoma originating from the appendix.

Resection of the Heel-Bone.—In one of Johansson's two cases the calcaneum had been destroyed by a tuberculous process. In the other case, in a boy of 12, the destructive process was a septic osteomyelitis. He urges the importance of getting the patient on his feet as soon as possible after the operation, but free from weight bearing. (In German.)

Local Eosinophilia.—Kühnel refers to the local eosinophilia in the vermiform appendix. It occurs in the normal as well as in the diseased appendix, but the eosinophil cells seem to vary in number and in arrangement in different pathologic conditions in a characteristic and instructively differential manner, as he shows in four colored plates. (In English.)

Hospitalstidende, Copenhagen

April 27, 1921, **64**, No. 17

*Paratyphoid Epidemic in Hospital. O. Rosing-Schow.—p. 257. Conc'n.
*Pernicious Anemia with Stricture in Intestine. E. Meulengracht.—p. 263.

Paratyphoid.—The paratyphoid in the recurring epidemics at the Viborg Hospital was so mild that in some of the cases only the positive agglutination reaction demonstrated that the subjects had been having the disease. Rosing-Schow has found a record of a similar mild paratyphoid in a company of 849 soldiers in 1911. Only forty-nine presented the clinical picture of paratyphoid, but 204 responded positively to agglutination tests. His own research has confirmed that persons may be left paratyphoid bacilli carriers, like the typhoid carriers. Possibly the presence of gallstones may be the only cause for the lingering of the bacilli, but these mild cases and carriers may spread the contagion.

Intestinal Stricture and Pernicious Anemia.—Meulengracht summarizes five cases of pernicious anemia in which during life or at necropsy a stricture had been found at one or more points in the bowel. All but one of the cases were published in Scandinavian literature, and he adds a case personally observed to the list, and refers to four other cases published with only meager details. This coincidence of bowel stricture and the development of pernicious anemia—both such rare conditions—seems to be more than casual. The strictures seem to be relics of old healed tuberculous ulcers; there was no evidence of recent tuberculosis. The diagnosis was made during life in only the English case. The stagnation and decomposition of feces above the stricture, with absorption through the bowel wall of toxic substances with a special destructive action on the blood explains the development of the pernicious anemia. The familial occurrence of pernicious anemia and other facts suggest that a predisposition is a necessary factor. This assumption of mechanical obstruction in the intestines as the primary cause of pernicious anemia is sustained by cases in which the pernicious anemia develops in the pregnant, in subjects with tapeworm, and with gastric achylia. The latter was evident in the five cases here described in which it had been tested. The data presented all sustain the theory of the intestinal origin of pernicious anemia.

May 4, 1921, **64**, No. 18

*Megacolon in Adults. T. Iversen.—p. 273. Conc'n No. 19, p. 289.

Megacolon in Adults.—In Iversen's two cases the enlargement was restricted to the sigmoid flexure and the rectum. Resection of the enlarged sigmoid loop was done in the first case but the stump of the rectum could not be sutured end-to-end to the colon as intended, on account of the huge size of the lumen of the rectum. The oral stump was brought out through the skin for a temporary anus, but the man died in collapse three days later. In the second case no attempt at suturing was made. The enlarged intestine was brought out and opened and a drain tube introduced, deferring the resection till later, merely making an artificial anus. Thirteen days later the exposed loop was resected with the actual cautery. The rectum contracted spontaneously and the artificial anus could be closed the sixty-third day. The man of 61 was restored to complete health by the end of the third month, and has been free from all intestinal disturbances during the more than two years since. Iversen compares his experience with that of others in such cases, adding that the length of the three months' course of treatment was amply outbalanced by the perfect outcome.

May 11, 1921, **64**, No. 19

*Microcytosis with Hemolytic Jaundice. H. C. Gram.—p. 294.

Hemolytic Jaundice.—Gram explains how the hemoglobin percentage can be normal in cases of hemolytic jaundice although the diameter of the erythrocytes averages less than normal. In two cases described in girls of 12 and 18, the erythrocytes although abnormally small in diameter were much thicker than usual, so the total bulk was normal.

Norsk Magazin for Lægevidenskaben, Christiania

June, 1921, **82**, No. 6

Schick Reaction in Course of Diphtheria. G. Reder.—p. 409.
*Trigeminal Neuralgia. V. Magnus.—p. 420.
Transient Hypermetropia in Diabetes. S. Hagen.—p. 424.
*Splenectomy in Hemolytic Jaundice. S. Widerøe and O. Jervell.—p. 428.
Cerebral Hemianesthesia. L. Nicolaysen.—p. 434.
*Transfusion in Pernicious Anemia. C. Müller and F. Jervell.—p. 442.

Trigeminal Neuralgia.—Magnus reports recurrence in twelve to eighteen months in all of the 29 cases in which he resected a peripheral portion of the nerve. In 211 of the 248 injections of alcohol, in 118 cases, the pain subsided at once after the injection, and one patient has had no recurrence for eight years and 4 for five years. In the others the pain returned in a year or year and a half. It was banished anew by injection of alcohol, but the respite was only temporary and operative measures were finally applied. In 24 of the patients two or three of the branches were affected and hence no attempt at alcohol injection was made, and the sensory pontine root of the nerve was resected at once. In 4 cases he partially resected the gasserian ganglion, with return of the pain in one case after a four year interval. In 4 of the 31 root-resection cases a corneal ulcer developed, but he ascribes this to the patients' neglect to heed instructions to wear protecting glasses when exposed to wind, or disregard of early signs of irritation in the eye.

Splenectomy with Inherited Hemolytic Jaundice.—Another case is described here of pronounced benefit after splenectomy in chronic inherited hemolytic jaundice. The patient was a woman of 30 and during the attacks of jaundice there were pains, fever and other symptoms of cholangitis. The jaundice appeared first after an attack of typhoid at 17, this evidently having aroused the latent inherited tendency. An operation for the assumed gallstones revealed normal anatomic conditions in the biliary apparatus, and the attacks of pain returned afterward as before until the splenectomy seven months later. In ninety-three cases on record there were four fatalities. In the case here reported the woman five months later still has occasional periods of slight jaundice, and Botzian has reported a similar case of not complete cure after the splenectomy.

Transfusion of Blood in Pernicious Anemia.—This communication describes a case in a man of 58 almost moribund from pernicious anemia who improved remarkably after infusion of 1,000 c.c. of citrated blood from four of his five sons. The improvement did not last long, and he died the seventh month. The length of survival of the infused erythrocytes is recorded for each infusion.